2021 Air Quality Annual Status Report (ASR)

In fulfilment of Part IV of the Environment Act 1995

Local Air Quality Management

Date: December 2021

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Endorsement from the Director of Health and Care, Staffordshire County Council

ASR 2018 Section 2.3 PM 2.5 - Local Authority Approach to Reducing Emissions and or Concentrations

Staffordshire County Council (SCC) is committed to working with partners to ensure that Staffordshire will be a place where improved health and wellbeing is experienced by all. Poor air quality has a negative impact on public health, with potentially serious consequences for individuals, families and communities. Identifying problem areas and ensuring that actions are taken to improve air quality forms an important element in protecting the health and wellbeing of Staffordshire residents. Improving air quality is often a complex issue, presenting a multi-agency challenge – so it is essential that all agencies work together effectively to deliver improvements where they are needed.

As Director of Health and Care across Staffordshire I endorse this Annual Status Report which sets out the position in all the Local Authorities across Staffordshire and Stoke-on-Trent.

At the end of 2020 our successful Staffordshire wide Air Aware Programme, a joint project led by Staffordshire County Council on behalf of all 8 Districts, Stoke-on-Trent City Council and funded by DEFRA, drew to a close. Building on this success Staffordshire County Council successfully bid for an additional £300k to develop and expand the Air Aware programme and deliver focused interventions in 3 Districts. The programme will be delivered between March 2020 and December 2022 and will focus on reducing levels of NO and PM, which will be monitored and evaluated through a network of air quality sensors.

In addition to the Air Aware programme, Staffordshire County Council is midway through trialling a number of innovative solutions to improve air quality in the county as part of our ADEPT Live Lab SIMULATE programme. SIMULATE is a £1.97 million challenge programme, delivered in partnership with AMEY, Keele University, Catapult Connected Places and is part of the ADEPT Smart Places Research Programme, designed to accelerate innovative solutions in Air Quality and Intelligent Mobility within local authorities. Trials include the installation of two living green walls and deployment of a number of Intelligent Transport Systems, all of which are being monitored and evaluated by a network of air quality sensors to understand their impact on air quality, and in particular levels of PM. The results of which will inform future activity and opportunities to scale up the most effective solutions to help combat poor air quality.

In addition, Officers from Newcastle Borough Council, Stoke City Council and Staffordshire County Council are jointly working under Ministerial Direction to improve transport related air pollution in North Staffordshire.

Yours sincerely

Dr Richard Harling MBE
Director of Health & Care

Executive Summary: Air Quality in Our Area

Air Quality in Lichfield District Council

Air pollution is associated with a number of adverse health impacts. It is recognised as a contributing factor in the onset of heart disease and cancer. Additionally, air pollution particularly affects the most vulnerable in society: children, the elderly, and those with existing heart and lung conditions. There is also often a strong correlation with equalities issues because areas with poor air quality are also often less affluent areas[1,2].

The mortality burden of air pollution within the UK is equivalent to 28,000 to 36,000 deaths at typical ages[3], with a total estimated healthcare cost to the NHS and social care of £157 million in 2017[4].

Lichfield District Council is situated in the north of the West Midlands, close to some highly industrialised parts of the UK. To the south west lies Walsall and Birmingham. The Lichfield District is only moderately industrialised, but there are a number of major roads in the region, including the M6 Toll, A38 and A5. Consequently, road traffic is the main source of air pollution in the area. Burntwood and Lichfield are the two largest urban areas in the District.

Lichfield District Council has two Air Quality Management Areas (AQMAs) that were declared due to exceedances of the annual mean nitrogen dioxide (NO_2) objective. Both are associated with emissions from road traffic. These can be seen at https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=147. A map of both AQMAs has been included in Appendix D.

AQMA no.1 was declared in August 2008 and encompasses the traffic dense area of the A5 Muckley Corner Roundabout, together with fourteen sensitive receptors (mainly

[1] Public Health England. Air Quality: A Briefing for Directors of Public Health, 2017

[2] Defra. Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006

[3] Defra. Air quality appraisal: damage cost guidance, July 2020

[4] Public Health England. Estimation of costs to the NHS and social care due to the health impacts of air pollution: summary report, May 2018

residential dwellings) around this junction.

During 2015, a Detailed Assessment was carried out on the A38. Modelling identified exceedances of the annual mean NO_2 objective at six isolated locations of relevant exposure covering a stretch of the A38 from the junction with the A5127 Burton Road to the northern boundary of the district. Lichfield District Council therefore declared AQMA No.2 which came into force in August 2016.

No exceedances of the annual mean NO_2 objective of 40µg/m^{3}were recorded at any location within the Lichfield District during 2020. Also no concentrations were recorded within 10% of the annual mean NO_2 objective, with all results below 36µg/m^3.

With respect to the hourly NO_2 objective, results for the past five years show there are no sites within the whole of the Lichfield District where the annual mean has been greater than 60µg/m^3; therefore it is unlikely that the hourly mean objective will be exceeded at any monitoring site.

Monitoring data from 2020 does not represent a normal year due to the emergence of the Covid-19 pandemic. With a significant reduction in vehicle journeys, NO_2 concentrations are much lower in 2020 across the whole District when compared with previous years and therefore the results should be treated with caution. Despite, results from 2016 to 2019 showing a general downward trend in NO_2 concentrations, there were still consistent exceedances of the objective within the A5 Muckley Corner AQMA up to and including 2019. For the A38 Streethay to Alrewas AQMA it was only in 2019 that NO_2 concentrations reached levels that were comfortably below the annual mean NO_2 objective.

While there were no new major air pollution sources identified during 2020 within the Lichfield District, the Council continues to work closely with partners and key stakeholders.

The District continues to attract new commercial and residential developments that incrementally increases emissions from activities such as vehicle usage. Lichfield District Council's Environmental Protection Team therefore has a close working relationship with the Planning Department to ensure applications for new developments protect air quality and human health in accordance with the National Planning Policy Framework (NPPF) and associated Technical Guidance. The Environmental Protection team has been a consultee on the Local Plan review, which contains a spatial strategy that sets out the overall approach towards provision for new homes, jobs, and infrastructure and

community facilities up to 2040. The spatial strategy seeks to concentrate major growth within urban areas alongside improvements to existing key services, facilities and infrastructure. This will contribute to reducing the need to travel, but also provide better opportunities for travel by public transport. Through the development of the employment locations it seeks to provide more local jobs and a wider variety of better paid local jobs to reduce out commuting levels. Review of the Local Plan began in 2018 and included the following stages;-

- Scope Issues and Options – this was the first stage of the process and set out the scope of the local plan review and presented its key issues along with a number of options;
- Preferred Options and Policy Directions – this document set out potential spatial options for the district and the broad preferred approach to the managing development;
- Preferred Options – this document set out the spatial strategy including proposed strategic sites and a number of policies for the management of development;
- Proposed publication plan – this document once adopted will represent the council's settled view of the contents of the Lichfield District Local Plan 2040. It went out for consultation in summer 2021 and once adopted will replace the current local plan strategy (which was adopted in 2015) and the local plan allocations document, which was adopted in July 2019. Adoption of the Local Plan is expected in 2022.

Lichfield District Council is also a member of the Staffordshire Air Quality Forum ('SAQF'), which has encouraged partnership working on local air quality management, which is important given the cross boundary nature of air pollution. The SAQF comprises of local authority air quality officers, Staffordshire County Council Highways officers, National Highways staff, County Public Health and Public Health England staff as necessary. The SAQF group also feeds back to the Central England Environmental Health Chief Officers and engages with other groups such as the Midland Joint Advisory Council. The main joint projects currently within the SAQF are:

- The SAQF group continue to collaborate with local Public Health Departments to review and assess $PM_{2.5}$ (fine particulate matter) levels in their ASRs (see Section 2.3).

- Following on from the Government's new Clean Air Strategy, Staffordshire County Council's Director of Public Health presented a report to the Staffordshire Health & Wellbeing Board (HAWB), highlighting the air quality situation across the whole of Staffordshire and activities identified as potentially making a positive contribution to air quality. From this a plan of action was produced for partnership working. The SAQF group subsequently worked with Staffordshire County Council and successfully secured a Defra funded bid to deliver for example business/ school travel plans across the Staffordshire authorities from July 2018 to July 2020. This project focussed primarily on AQMAs affected by roads under Staffordshire County Highways jurisdiction. While Lichfield District Council's AQMAs are under the jurisdiction of National Highways, formerly known as Highways England, this Authority continues to liaise with the County Council to identify other initiatives or projects that could also benefit the two AQMAs in the Lichfield District and indeed the wider area too, wherever possible.
- Work on a joint Supplementary Planning Guidance for Planners and Consultants was planned in 2020, based on similar guidance produced collaboratively by a number of the East Midlands Authorities. Although implementation has been delayed due to staff turnover and resource constraints primarily from the ongoing Covid-19 pandemic, however there remains a commitment to see this through, and a template document has been drafted. This measure is also included in Lichfield District Council's Air Quality Action Plan (AQAP). More details are provided in Section 2.2.
- Finally, Lichfield District Council like all other Staffordshire authorities benefits from having an Integrated Transport Strategy (ITS) specific to the District. The measures in the ITS are aimed at transport measures under the County Council's jurisdiction, which for the Lichfield District are outside of the two AQMAs and currently are not included in the Action Plan as they are unlikely to significantly benefit the two AQMAs. The ITS measures will nevertheless provide some benefit in easing congestion and improving public transport connectivity to the main settlements in the District and therefore will help maintain concentrations of air pollutants below the objectives outside of the AQMAs. A summary of ITS measures already completed and planned for the coming reporting year are outlined in Appendix C.

The key major development within the Lichfield District is the ongoing High Speed Two project. Both Phase One and Phase 2a of HS_2 will pass through the Lichfield District. Civil works for Phase One commenced in summer 2019, with the construction of a haul road for construction traffic off the A38 at Streethay completed early in 2020, as well as compounds at various other sections along the route during the course of 2021. At this stage it is considered unlikely that HS_2 will have any significant adverse air quality impacts, however LDC will continue to liaise with HS_2, their contractors and other affected authorities throughout the process. A summary of HS_2 to date is presented in Appendix C.

One other major development is the southern bypass from the A5206 London Road to the A5127 Birmingham Road which was officially opened in October 2021. This new road should reduce traffic coming into the city centre and therefore congestion.

Actions to Improve Air Quality

Whilst air quality has improved significantly in recent decades, and will continue to improve due to national policy decisions, there are some areas where local action is needed to improve air quality further.

The 2019 Clean Air Strategy[5] sets out the case for action, with goals even more ambitious than EU requirements to reduce exposure to harmful pollutants. The Road to Zero[6] sets out the approach to reduce exhaust emissions from road transport through a number of mechanisms; this is extremely important given that the majority of Air Quality Management Areas (AQMAs) are designated due to elevated concentrations heavily influenced by transport emissions.

As the roads within both AQMAs are strategic roads that are under the jurisdiction of National Highways, Lichfield District Council has no direct control over any intervention measures and is therefore heavily reliant on National Highways and other relevant bodies such as Midlands Connect to implement the proposed measures within the Action Plan. Most of the measures within the final Action Plan are therefore targeted at improving traffic

[5] Defra. Clean Air Strategy, 2019

[6] DfT. The Road to Zero: Next steps towards cleaner road transport and delivering our Industrial Strategy, July 2018

flows within the two AQMAs through partnership working with National Highways and Midlands Connect. Partnership working had commenced late in 2019 with both organisations regarding measures targeted primarily at the A5 corridor that includes the Muckley Corner AQMA. A study of a 53 mile long section of the A5 corridor between the M6 and M1 was conducted by Midlands Connect, to establish the strategic and economic rationale of transport improvements on the corridor. A number of options for junction improvements within the Muckley Corner AQMA as well as Wall Island were considered but unfortunately were not taken forward as the central section of the A5 corridor (Hinkley to Tamworth), which lies outside of the jurisdiction of Lichfield District Council, was identified as the priority for investment. Although future interventions within the AQMA have not been ruled out.

Aside from the aforementioned measures, Lichfield District Council reviewed its NO_2 diffusion tube monitoring network in October 2019 with an additional nine sites being added outside of the AQMAs as recommended by Defra in its feedback from the 2019 ASR. These are located at key positions along the main arterial routes through Lichfield as well as locations in Armitage in the west of the District and Fazeley in the east and a full calendar year of data is presented in this ASR for these new sites.

Lichfield District Council also made improvements to the information available to the public on its air quality web pages early in 2020. Information on ways residents and businesses can make their own contribution to improving air quality in the district has also been added.

Conclusions and Priorities

This ASR concludes that up to and including 2019, AQMA No.1 encompassing the A5 Muckley corner junction continued to experience exceedances of the annual mean NO_2 objective of 40µg/m^3. Meanwhile AQMA No.2 for the A38 has recorded concentrations below the annual mean NO_2 objective for the past four years, but it was not until 2019 that concentrations dropped below 36µg/m^3 (i.e. greater than 10% of the objective). For 2020, all monitoring sites including those within AQMA No.1 recorded NO_2 concentrations that not only fell below the annual mean objective, but also fell below 36µg/m^3. It is important to note that due to the Covid-19 pandemic, 2020 will not be an accurate representation of a typical year, as traffic levels were much reduced due to two lockdowns and various other restrictions. It is still uncertain when traffic levels will return to normal, as at the time of writing the impacts of the pandemic are still being felt. It may not be until late in 2022 or

beyond that a rebound in activity occurs, and even then the extent of any rebound is uncertain. The impact of the Covid-19 pandemic may well alter people's lifestyles and travelling behaviours even after the pandemic has subsided, as has already been seen with homeworking and virtual meetings now becoming the norm. This could be to the benefit of air quality, but at this stage it is too early to predict. Lichfield District Council therefore proposes to continue monitoring both inside and outside of the AQMAs throughout 2021 and 2022 before making a decision on whether to revoke the A38 AQMA. More details on the impact of the pandemic on air quality and the ability of the Council to exercise its LAQM duties are provided in Appendix F.

The main priority for Lichfield District Council for the coming year is to continue to engage with National Highways and Midlands Connect regarding transport intervention measures for the A5 Muckley Corner. As these roads are under the jurisdiction of National Highways, transport intervention measures are largely out of this Council's direct control, hence it is vital to keep the pressure and momentum going to ensure cost effective solutions are sought. However, this is dependent on the outcome of any continued monitoring within the AQMAs and the impact of any rebound from the pandemic, which still remains uncertain.

Lichfield District Council along with its counterparts in other Staffordshire Authorities have committed to developing technical air quality guidance for developers and planners to ensure a commensurate approach to the assessment of air quality across the whole of Staffordshire. The guidance will set out criteria for minimising, offsetting and mitigating the impacts of developments on local air quality, both in terms of operational impacts and demolition/construction impacts. Work has started on drafting the guidance, but due to the impacts of the Covid-19 pandemic, progress has stalled. The aim is to then later incorporate this guidance formally into an air quality SPD that complements the emerging Local Plan that is expected to be adopted in 2022.

Local Engagement and How to get Involved

Due to the main source of air pollution within Lichfield District Council being from transport sources, the easiest way for the public to get involved in aiding air quality improvements within the area would be to look at alternatives modes of travel. The following are suggested alternatives to private travel that would contribute to improving air quality within the District:

Think Before You Drive

- Avoid vehicle idling and/or use of air conditioning running continuously. By switching your engine off you can save fuel, money and improve local air quality
- Consider leaving the car at home one day a week.
- **Walk or cycle** – From choosing to walk or cycle for your journey the number of vehicles is reduced and also there is the added benefit of keeping fit and healthy. In addition many of the cycle routes are off-road meaning you are not in close proximity to emissions from road traffic sources. Information on cycle routes within the Lichfield area is currently available on Staffordshire County Council's website at the following link, https://www.staffordshire.gov.uk/Transport/cycling/Documents/Cycling-in-Lichfield-including-Burntwood-Issue-5.pdf;

Lichfield District Council endorses the Staffordshire Air Aware website set up by Staffordshire County Council, which provides more detail on reducing reliance on personal vehicle use. This can be viewed at https://www.staffordshire.gov.uk/DoingOurBit/Get-Inspired/Clean-green-and-safe/Air-aware/Air-aware.aspx

- **Hold meetings by Conference Call** by phone, Microsoft Teams or Skype rather than driving to meetings. This reduces fuel, vehicle maintenance and other travel costs, and increases productivity through reduction in hours lost through unnecessary travel.
- Facilitate **Flexible Working Arrangements** for staff to work remotely from home or hubs closer to home for one or more days a week thus removing or reducing commuter journeys. This reduces congestion which has beneficial impacts for delivery times, reduced business costs and thus economic benefits. Additionally, it provides social benefits through improved work-life balance for employees and helps to improve local air quality and reduced emergency vehicle response times.
- **Switch Fleet to Low or Zero Emission Vehicles**: Eligible businesses, charities, and public sector organisations with off street parking for staff or vehicles fleets can apply for vouchers to redeem costs of electric vehicle charge-points. There is an approved charge points list and a list of authorised installers.

  https://www.gov.uk/government/collections/government-grants-for-low-emission- vehicles#workplace-charging-scheme

- If you must drive consider fuel efficient driving advice, known as 'Smarter Driving Tips', which ultimately will save you on fuel costs and reduce your emissions. Several websites promote such advice including:

  https://energysavingtrust.org.uk/advice/ecodriving/

  https://www.theaa.com/driving-advice/fuels-environment/drive-smart

  https://www.vehicle-certification-agency.gov.uk/fcb/smarter-driving-tips.asp

Energy Efficiency

Improving the energy efficiency of your home / school / workplace will help reduce energy bills, as well as reducing emissions associated with power generation. The Energy Savings Trust (EST) which is a non-profit organisation, funded by the government and private sector can provide independent and impartial advice to help consumers in lowering emissions and cut their energy bills. For further information, visit the EST website at https://www.energysavingtrust.org.uk/

Around The Home

- Use water-based or low solvent paints, glues, varnishes and wood preservatives, look for brands with a low VOC content.
- Have your central heating system checked regularly to avoid risking exposure to toxic carbon monoxide.
- Smoke Control Areas have been declared covering the settlements of Lichfield, Burntwood, Armitage / Handsacre and Fazeley at the eastern district boundary with Tamworth Borough Council. In a Smoke Control Area you need to make sure that any appliance is exempt or is included in the list of authorised fuels. Defra keeps a list of approved appliances and authorised fuels that are permitted for use in smoke control areas at https://smokecontrol.defra.gov.uk/appliances.php?country=england. Ready to use wood bought from a Woodsure Certified Supplier will offer the following benefits:
  - Dry, ready to burn wood/logs & briquettes make any appliance more efficient.
  - Burning dry wood instead of wet wood is part of the solution to reducing the impact on our environment.

- Burning wet wood increases emissions and the impact on air quality.
- Any appliance and chimney system will suffer from smoke produced from wet wood, which increases maintenance and repair requirements, making it harder for chimney sweeps to keep systems in safe, effective condition.
- Burning waste and treated wood (e.g. old furniture) can emit harmful fumes.

Other Considerations

- When planning days out or journeys to work, check the air pollution forecast at https://uk-air.defra.gov.uk/forecasting/
- Be energy efficient - make sure your house is well insulated and use energy efficient appliances https://www.energysavingtrust.org.uk/home-energy-efficiency
- Refrain from having bonfires or barbecues when air pollution levels are high. Furthermore due to the current Covid-19 pandemic Lichfield District Council would discourage bonfires as they could impact upon the ability of other residents in the local area who may be isolating at home to recover from Covid-19 or residents with existing cardiovascular/respiratory conditions who may be more susceptible to infection.
- Never burn household waste, especially plastics, rubber and treated timber.
- Lichfield District Council's annual air quality reports are accessible from https://www.lichfielddc.gov.uk/downloads/download/47/air-quality-monitoring-reports.

Global Action Plan, a charity that is working for a green and thriving planet have for the first time provided a hub called the Clean Air Hub, that brings together public accessible information on air pollution all in one place. Whether you want to learn more about what air pollution is, how it affects your health, what you can do to protect yourself from it and the action you can take to tackle it, then the collection of information, resources and expert advice on the Clean Air Hub will help and inspire you to get informed and involved. The Clean Air Hub can be accessed from the following web link; https://www.cleanairday.org.uk/pages/category/clean-air-hub

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Tables

1 Local Air Quality Management

This report provides an overview of air quality in Lichfield District Council during 2020. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) and the relevant Policy and Technical Guidance documents.

The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where an exceedance is considered likely the local authority must declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives. This Annual Status Report (ASR) is an annual requirement showing the strategies employed by Lichfield District Council to improve air quality and any progress that has been made.

The statutory air quality objectives applicable to LAQM in England are presented in Table E.1.

2 Actions to Improve Air Quality

2.1 Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority should prepare an Air Quality Action Plan (AQAP) within 12 months setting out measures it intends to put in place in pursuit of compliance with the objectives.

A summary of AQMAs declared by Lichfield District Council can be found in Table 2.1. The table presents a description of the two AQMAs that are currently designated within Lichfield District Council. Appendix D: Map(s) of Monitoring Locations and AQMAs provides maps of AQMAs and also the air quality monitoring locations in relation to the AQMAs. The air quality objectives pertinent to the current AQMA designations are as follows:

- NO_2 annual mean;

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance: Declaration	Level of Exceedance: Current Year	Name and Date of AQAP Publication	Web Link to AQAP
A5 Muckley Corner AQMA no.1	01/08/2008	NO_2 Annual Mean	An area encompassing the Muckley Corner Roundabout on the A5 along with fourteen surrounding buildings.	YES	51 µg/m^3	34.3 µg/m^3	Air Quality Action Plan for AQMA 1 & AQMA 2 – Final (09/08/2019)	https://www.lichfielddc.gov.uk/downloads/file/1469/air-quality-action-plan-august-2019
A38 AQMA no. 2	01/08/2016	NO_2 Annual Mean	A38 from the junction of A5127 Streethay north to Alrewas	YES	35.7 µg/m^3	25.2 µg/m^3	Air Quality Action Plan for AQMA 1 & AQMA 2 – Final (09/08/2019)	https://www.lichfielddc.gov.uk/downloads/file/1469/air-quality-action-plan-august-2019

☒ **Lichfield District Council confirm the information on UK-Air regarding their AQMA(s) is up to date.**

☒ **Lichfield District Council confirm that all current AQAPs have been submitted to Defra.**

2.2 Progress and Impact of Measures to address Air Quality in Lichfield District Council

2.2.1 Defra summary of last year's ASR

Lichfield District Council is still awaiting Defra's appraisal of last year's (i.e. 2020) ASR. However the main comments from Defra's appraisal of the 2019 ASR are still relevant and are listed below, together with an explanation or comment on how Lichfield District Council addressed these in both the 2020 and 2021 ASRs. The main points/comments from the 2019 ASR appraisal are:-

1. **Trends are clearly presented and discussed and a robust comparison with air quality objectives is provided. This was at district level, for each AQMA and also for each individual monitoring site.**

   LDC Comment: Comment Noted

2. **The diffusion tube mapping is comprehensive and clearly demonstrates the monitoring network. AQMA boundaries are also clearly shown on the map.**

   LDC Comment: Comment Noted

3. **Additional diffusion tube monitoring could be introduced to identify other hotspots within the district.**

   LDC Comment: The diffusion tube network was reviewed in October 2019 and an additional nine new sites were added to the network mainly within Lichfield itself. For this 2021 ASR we now a have a full calendar year of data for these additional sites. More detail is provided on these new sites in the monitoring data provided in Chapter 3 and in Appendix A and D. Note: A couple more sites were added in 2021 but this will fall under the scope of next year's ASR.

4. **There were multiple exceedances of the NO_2 annual mean within the Muckley corner AQMA. There were no exceedances within the A38**

AQMA but there has been in recent years. The 2 AQMA declarations continue to be necessary.

LDC Comment: Comment noted and monitoring within the AQMAs and wider area continues.

5. **Adoption of the revised AQAP is expected during the next reporting year. The second draft is currently out for consultation until early August 2019. There is detailed discussion of the challenges and barriers to implementation that the Council anticipates facing.**

   LDC Comment: LDC adopted the AQAP in August 2019 following positive comments and feedback from stakeholders. More detail is provided below.

6. **The report links to Public Health Outcomes Frameworks and provides detailed information on how the district is working to improve $PM_{2.5}$ concentrations.**

   LDC Comment: Comment noted

7. **The additional appendices covering new developments and progress against the Integrated Transport Strategy are welcomed.**

   Lichfield District Council Comment: Comment: An update on new developments and the Integrated Transport Strategy is again provided in Appendix C of this 2021 report.

8. **There was one monitoring site in 2017 that required annualisation. As no continuous monitoring is carried out within the District, then diffusion tube sites from background locations with 12 months' data may be used, as was done in this report. To further improve the accuracy of this, the more background sites that can be used the better and an average of these ratios can be taken. Alternatively, continuous monitoring data from any background site within a 50km radius is also acceptable.**

   Lichfield District Council Comment: Defra's comments were taken on board for both the 2020 and 2021 reports, see Appendix C. In the case

of this 2021 report, automatic monitoring data from relevant AURN sites were used to annualise passive monitoring data.

9. **Detailed, practical advice is given for how local residents can get involved in tackling air quality.**

   Lichfield District Council Comment: Further practical advice for local residents is provided in this report as well as on its air quality web pages.

2.2.2 Key actions progressed in 2020-2021

Lichfield District Council adopted its final AQAP on 9th August 2019, applicable to both AQMAs. This followed a consultation exercise with relevant stakeholders for example Highways England (HE), now known as National Highways and Midlands Connects (an overarching strategy group of local authorities including Staffordshire County Council, Local Enterprise Partnerships and other key partners from across the Midlands). The focus of AQAP measures are divided into five targeted categories;

1) Transport measures;
2) Leading by example measures;
3) Education, community and partnership measures;
4) Statutory measures; and
5) Air quality monitoring

Details of all measures completed, in progress or planned are set out in Table 2.2 .

Partnership working with then HE and Midlands Connect commenced late in 2019 with regards to transport intervention measures targeted primarily at the A5 corridor that includes AQMA.1 at Muckley Corner. A study of a 53 mile long section of the A5 corridor between the M6 and M1 was conducted by Midlands Connect. The purpose of this study was to establish the strategic and economic rationale of transport improvements on the corridor. A number of options for junction improvements within the Muckley Corner AQMA as well as Wall Island were considered but unfortunately were not taken forward as the central section of the A5 corridor (Hinkley to Tamworth), which lies outside of the jurisdiction of Lichfield District Council, was identified as the priority for investment. National Highways Road Investment Strategy

2: 2020-2025 sets out the priorities and details for proposed interventions on the central section of the A5 along with other trunk roads within England. The main reason for the central section of the A5 taking priority is due to the level of development taking place within this section.

Lichfield District Council reviewed its NO_2 diffusion tube monitoring network in October 2019 with an additional nine sites being added outside of the AQMAs as recommended by Defra in its feedback from the 2019 ASR. These are located at key positions along the main arterial routes through Lichfield that is the A5127 Trent Valley Road, the A51 Upper St John Street and Beacon Street. Other new tube locations include the A513 Rugeley Road, Armitage in the west of the District and a location at Fazeley in the east. Locations of the new diffusion tube monitoring sites are shown in Appendix D. The Council now has a full calendar year of data for these new monitoring positions, albeit the results are skewed by the impact of the Covid-19 pandemic on reduced traffic levels. Results from the new monitoring positions are presented in Appendix A and discussed in Section 3 of this report.

Early in 2020, Lichfield District Council made improvements to the information available on its air quality web pages. This includes links to the AQMAs, the now adopted AQAP and recent ASRs. Tips on how residents and businesses can contribute to improving air quality in the District have also been added with useful links such as Staffordshire Air Aware.

2.2.3 Priorities for the next year

Lichfield District Council's priorities for the coming year are

- To continue liaising with National Highways and Midlands Connects in pursuit of identifying targeted transport improvement measures for the A5 Muckley Corner AQMA, depending on the level of exceedances, if any are identified through continued diffusion tube monitoring through 2021 and into 2022.
- Working with our counterparts across the other Staffordshire Authorities, technical planning guidance for planners and developers will be produced to supplement the National Planning Policy Framework (NPPF). The guidance will take a similar form to that already undertaken by the East Midlands Air Quality Partnership. The aim of this guidance is to provide clear information on what is required and how planning applications are evaluated in terms of air quality. The guidance will primarily be focussed on minimising or offsetting the

impacts of emissions wherever practicable, by securing reasonable emission mitigation measures such as EV charging infrastructure to ensure sustainable development and improve air quality across Staffordshire. While road transport emissions will be the main focus of the guidance, other emission sources such as biomass plants, generators etc. will also be included, as will dust from construction and demolition sites. The aim then is to feed this formally into the emerging LDC Local Plan which due to delays from the pandemic is now expected to be finalised in 2022.

- To work with our Planning Policy colleagues to increase the provision of EV charging infrastructure in the council's car parks and on-street parking as part of the car park strategy. At the time of writing this is at the early stage of planning, but would be a new measure within the AQAP.
- While homeworking has been the norm for everyone during the ongoing Covid-19 pandemic. At the time of writing, Lichfield District Council is currently having internal alterations with a significant reduction in workstations hence homeworking and virtual meetings will continue to long after the pandemic has subsided. Essentially this replaces the previous measure in the AQAP for Staff Travel Plans.
- To continue air quality monitoring within and outside of the two AQMAs and where possible extend the diffusion tube network further.
- To continue partnership working within the SAQF and Public Health and where possible engage more with schools and businesses.
- To consider any air quality grant funding for initiatives, EV charging infrastructure or continuous air quality monitors as and when they become available. This may take the form of a collective bid with the other Staffordshire Authorities.
- To continue statutory duties with respect to the Environmental Permitting Regulations.
- To complete the 2022 ASR and submit to Defra

2.2.4 Challenges and barriers to implementation

The principal challenges and barriers to implementation that Lichfield District Council anticipates facing are that the key measures to target air quality in the two AQMAs are out this Council's direct control. Most relate to interventions that would specifically target traffic flow on strategic roads (A5 and A38) for which National Highways would be the lead authority. As previously mentioned, National Highways are prioritising the central section of the A5 which lies outside of the Lichfield District and there are currently no immediate plans for transport intervention measures at the Muckley Corner AQMA. This is further compounded by the impact of the Covid-19 pandemic. There was a significant reduction in traffic levels throughout 2020 and there are indications this has continued in 2021. Any rebound is currently uncertain and can only really be assessed through continued diffusion tube monitoring within the AQMAs to determine its impact, the level of emissions reductions required, if at all and in turn whether transport intervention measures are still required. Lichfield District Council will nevertheless continue to liaise with National Highways and update them on any changes in air quality.

Another major challenge which Lichfield District Council anticipates facing is the long term impacts and unpredictable nature of the Covid-19 pandemic. During 2020 and much of 2021, Council resources have been diverted to deal with the direct and indirect impacts of the pandemic, which has led to delays in progressing AQAP measures such as the air quality technical guidance for planners and developers and indeed the completion of this 2021 ASR. It is anticipated resources may still be impacted into the early part of 2022. Intermittent rules on social distancing are likely to come and go into 2022 which will also hamper any direct engagement with businesses, residents and schools. There is also the economic uncertainty associated with the pandemic which in turn will have a knock on effect on funding, hence the implementation of some measures could be delayed further or revised to compensate.

2.2.5 Final note

Lichfield District Council anticipates that the measures stated above and in Table 2.2 will achieve compliance in both AQMA 1 and AQMA2.

Whilst the measures stated above and in Table 2.2 will help to contribute towards compliance, Lichfield District Council anticipates that further additional measures not yet prescribed will be required in subsequent years to achieve compliance and enable the revocation of AQMA 1 and AQMA 2.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
1	Increase the volume of through traffic using M6 Toll	Traffic Management	UTC, Congestion management, traffic reduction	2019	TBC	Lichfield District Council Environmental Health, National Highways, Midlands Connect	Defra and LA	No	-	TBC	Planning	TBC after quantitative appraisal	Reduction in HGV % in AQMAs	Work is ongoing with Midlands Connects. There are no immediate plans for this, but the measure has not been ruled out	Subject to work undertaken by Midlands Connect Partnership
2	Upgrading Trunk A-Roads to Expressways	Traffic Management	UTC, Congestion management, traffic reduction	2019	TBC	Lichfield District Council Environmental Health, National Highways, Midlands Connect	N/A	No	-	TBC	Amended	TBC after quantitative appraisal	Reduction in traffic congestion	Regular discussions with National Highways / Midlands Connects since June 2019. The A5 corridor had previously been identified as priority for congestion control, but the central section which lies outside of the Lichfield District has been prioritised for transport intervention measures. Junction improvements at Muckley Corner had been considered but as yet are not being prioritised.	Subject to commitment from National Highways to deliver – this measure may never happen but it included as Lichfield DC is committed to maintain pressure for it to happen depending on the ongoing results of air quality monitoring
3	Pollution abatement equipment for HGVs	Vehicle Fleet Efficiency	Vehicle Retrofitting programmes	2019	2025	Lichfield District Council Environmental Health, OLEV	OLEV or other Defra Funds	Yes (if available)	Partial or Full TBC	£100k - £500k	Planning	Reducing emissions contribution from HGVs TBC	Retrofit vehicles	Planning phase	Consider OLEV or AQ grant application funding
4	Replacing older vehicles	Promoting Low Emission Transport	Company Vehicle Procurement - Prioritising uptake of low emission vehicles	2019	Ongoing	Lichfield District Council Environmental Health & Licensing, OLEV	OLEV or other Defra Funds	Yes (if available)	Partial or Full TBC	£100k - £500k	Planning	Reducing emissions from all council owned vehicles TBC	Vehicles replaced (in addition to normal fleet turnover)	Planning phase	Consider OLEV or AQ grant application funding
5	Travel planning amongst Council employees	Promoting Travel Alternatives	Workplace Travel Planning	2019	2021	Lichfield District Council	Internal Lichfield District Council Funds	No	-	< £10k	Discontinued & replaced with Measure No. 11	-	Reducing emissions from Council employees	Discontinued & replaced with Measure No. 11	-
6	Education Initiatives inc. website information updates	Public Information	Other	2019	2020	Lichfield District Council Environmental Health	Internal Lichfield District Council Funds	No	-	< £10k	Completed	Incremental through public awareness	Public Awareness	Completed early in 2020 although regular updates will be carried out moving forward	None to date
7	Staffordshire Air Quality Forum	Policy Guidance and Development Control	Regional Groups Co-ordinating programmes to develop Area wide Strategies to reduce emissions and improve air quality	2019	Ongoing	County-wide	Staffordshire Authorities	No	-	< £10k	Planning	-	Full LA engagement across the group + Regular Meetings	Ongoing	Engagement reduced during the pandemic due to restrictions & resource constraints
8	Use the planning regime to minimise impact of new developments on AQMAs	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2019	Was 2021 now 2022	Lichfield District Council / Staffordshire AQ Forum	Staffordshire Authorities	No	-	< £10k	Planning	Reducing emissions contribution and restricting impact on AQMAs	Supplementary Planning Guidance implemented	Discussions have already taken place and a general template to the guidance is in draft stages	Due to the Covid-19 pandemic and associated resource constraints progress has stalled, but there is still a commitment to implement
9	Inspect under the	Environmental Permits	Introduction/ increase of	2019	Ongoing	Lichfield District Council	Internal funds	No	-	< £10k	Implementation	Installations adhering to permits and	Installations adhering to permits and	On Target	-

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
	Environmental Permit regime and enforce legislation to reduce combustion processes		environment charges through permit systems and economic instruments			Environmental Health	generated through permitting regime					enforcement/penalties for breaches	enforcement/penalties for breaches		
10	Air quality monitoring	Public Information	Other	2019	Ongoing	Lichfield District Council Environmental Health		No	-	< £10k	Implementation	Will enable any changes in pollution levels to be identified	Monitoring locations and On-time submittal of ASRs	New locations were added to the network in October 2019. Monitoring to continue both inside and outside of AQMAs	Possibly liaise with Defra regarding need for additional monitoring and/or AURN funding. Consider continuous monitoring and AQ grant application if available or needed.
11 (Replaces Measure 5)	Homeworking	Promoting Travel Alternatives	Encourage / Facilitate home-working	2021	2022	Lichfield District Council employees	Internal Funds	No	-	< £10k	Implementation	Minimal but shows the Council can lead by example	Reducing emissions from Council employees	Internal building works to reduce number of workstations hence number of staff already commenced late 2021	-
12	Increased provision of EV charging infrastructure	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2021	TBC	Lichfield District Council Planning Policy & Environmental Health	TBC Through scoping	Unknown at present	-	TBC through scoping	Early Planning	Incremental	Reduction in pollutant levels in vicinity of council car parks	Lichfield District Council has started to review its car park strategy for the District in pursuit of increasing the provision of EV charging infrastructure	Funding

2.3 $PM_{2.5}$ – Local Authority Approach to Reducing Emissions and/or Concentrations

As detailed in Policy Guidance LAQM.PG16 (Chapter 7), local authorities are expected to work towards reducing emissions and/or concentrations of $PM_{2.5}$ (particulate matter with an aerodynamic diameter of 2.5µm or less). There is clear evidence that $PM_{2.5}$ has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

Particulate matter, or PM, is the term used to describe particles found in the air, including dust, dirt and liquid droplets. PM comes from both natural and man-made sources, including traffic emissions and Saharan-Sahel dust. These particles can be suspended in the air for long periods of time, and can travel across large distances.

PM less than 10 micrometres in diameter (PM_{10}) pose a health concern because they can be inhaled into and accumulate in the respiratory system. PM less than 2.5 micrometres in diameter ($PM_{2.5}$) are referred to as "fine" particles and are believed to pose the greatest health risks, as they can lodge deeply into the lungs and also pass into the bloodstream.

$PM_{2.5}$ is the pollutant which has the biggest impact on public health and on which the Public Health Outcomes Framework (PHOF) D01 Fraction of mortality attributable to particulate air pollution (2019), Public Health Outcomes Framework indicator[7] is based.

The Royal College of Physicians (RCP) undertook a review in February 2016,[8] where they found that long term exposure to air pollution impairs lung function growth in children, and that outdoor exposure is linked to lung cancer in adults. Within Staffordshire it is estimated that 5.1% of all deaths can be attributed to exposure to $PM_{2.5}$, compared to 5.1% across England (25,120 deaths annually). Overall, the estimated cost to individuals and society is more than £20 billion annually for the UK.

[7] Public Health England. Public Health Outcomes Framework Public Health Outcomes Framework - Data - PHE

[8] ['Every Breath we Take: The Lifelong Impact of Air Pollution; Report of a working Party, February 2016, ISBN 978-1-86016-567-2],

2.3.1 Particulate Matter ($PM_{2.5}$) Levels in Staffordshire and Stoke-on-Trent

There are currently no automatic $PM_{2.5}$ monitoring stations in the Lichfield District. However, a number of the Staffordshire Authorities currently monitor locally for PM_{10}. Defra's Automatic Urban and Rural Network (AURN) site, Stoke-on-Trent Centre has a dedicated $PM_{2.5}$ monitor. Table 2.3 presents data on the local level of $PM_{2.5}$ annual mean concentrations for the Staffordshire Authorities. Where the data is derived from PM_{10} monitoring this has been adjusted by applying a correction factor of 0.7 to derive the $PM_{2.5}$ component. The correction factor has been derived from the average of all ratios of $PM_{2.5}/PM_{10}$ for the years from 2010 to 2014 for forty sites within the Automatic Urban and Rural Network (AURN) where these substances are measured on an hourly basis and follows the guidance published in LAQM (TG16). As can be seen from the results in Table 2.3 , concentrations of $PM_{2.5}$ within the Staffordshire Authorities are below the 2020 EU limit value of 25µg/m^3.

The Defra national background maps have been reviewed to determine projected $PM_{2.5}$ concentrations within the Lichfield District for the 2020 calendar year. The average total $PM_{2.5}$ at 329 locations (centre points of 1km x 1km grids) across the Lichfield District is 7.93µg/m^3, with a minimum concentration of 6.73µg/m^3 and a maximum concentration of 10.78µg/m^3. This indicates that $PM_{2.5}$ concentrations within the Lichfield District are well below the annual average EU limit value for $PM_{2.5}$ of 25µg/m^3.

Table 2.3 - Annual Mean PM_{10} and $PM_{2.5}$ results of monitoring by Staffordshire Authorities 2016 to 2020

Annual Mean PM_{10} and $PM_{2.5}$ Results from monitoring Staffordshire Authorities 2016- 2020									
Authority	**Site Type**	**Monitor Location**	**OS Grid Ref**		**Year**				
					2016	**2017**	**2018**	**2019**	**2020**
Newcastle under Lyme	Roadside	Queen`s Gardens	E385057 N346137	PM_{10}	(5)	(5)	(5)	(5)	(5)
				$PM_{2.5}$	(5)	(5)	(5)	(5)	(5)
Cannock Chase	Roadside	Cannock A5190	E401392 N309954	PM_{10}	-	14	18	16	
				$PM_{2.5}$	-	9.8	12.6	11.2	
Stoke on Trent	Roadside	Basford	E386288 N346802	PM_{10}	-	23	23	23	*
				$PM_{2.5}$	-	16(1)	16(1)	16(1)	*
	Roadside	A50 Roadside Meir	E392548 N342572	PM_{10}	20(2)	18	19	20	17
				$PM_{2.5}$	14(2)	13(1)	13(1)	14(1)	12(1)

	Urban Background	Stoke on Trent Central	E388351 N347895	PM_{10}	12	9	9	9	7
				$PM_{2.5}$					
	Roadside	Middleport	E385780 N349376	PM_{10}	(3)	(3)	(3)	(3)	(3)
				$PM_{2.5}$	(3)	(3)	(3)	(3)	(3)
East Staffordshire	Roadside	Derby Turn	E424671 N324019	PM_{10}	(4)	(4)	(4)	(4)	(4)
				$PM_{2.5}$	(4)	(4)	(4)	(4)	(4)

Notes: (1) $PM_{2.5}$ results are derived from PM_{10} monitored results corrected with a 0.7 correction factor in accordance with TG16 – Annex B: Derivation of $PM_{2.5}$ to PM_{10} Ratio. All other results are directly monitored.

(2) Valid data capture for 2015 was 59%. The site was commissioned on 22 May 2015.

(3) Middleport monitor was decommissioned at the end 2015

(4) East Staffordshire`s monitors were decommissioned 2016

(5) Newcastle under Lyme monitors were decommissioned 2016

* No data available for 2020.

Although the levels of $PM_{2.5}$ within the County and City of Stoke on Trent are below the 2020 EU Limit value, the impact on adult mortality directly attributable to $PM_{2.5}$ is nonetheless still an important public health issue within Staffordshire and Stoke-on-Trent. This is revealed in data obtained from Public Health England used to inform the Public Health Outcomes Framework indicator D01, as shown in Table 2.4

The percentage estimated number of deaths attributable to $PM_{2.5}$ in adults over 30 has been translated into the estimated number of attributable deaths for each local authority area within Staffordshire, and are shown in Table 2.5 . The data presented to 2019 is the latest data available at time of publication of this report. Approximately 5.1% of deaths within the County can be attributed to $PM_{2.5}$.

Table 2.4 - Estimated average number of deaths by local authority area attributable to $PM_{2.5}$ within Staffordshire for adults over 30 (2015 to 2019)

District/County	Percentage
Newcastle-under-Lyme	4.4%
Stafford	4.6%
East Staffordshire	5.1%
South Staffordshire	4.8%
Lichfield	5.0%
Staffordshire Moorlands	4.2%
Cannock Chase	4.9%
Tamworth	5.3%
Stoke on Trent	4.7%
Staffordshire County	4.7%
England	5.1%

Table 2.5 - Public Health Outcomes Framework Indicator 3.01- Fraction of annual all cause adult mortality attributable to anthropogenic (human made) particulate air pollution (measured as fine particulate matter, $PM_{2.5}$) for Staffordshire Authorities 2015 to 2019

Estimated numbers of annual all-cause adult mortality attributable to anthropogenic (human-made) particulate air pollution (measured as fine particulate matter, $PM_{2.5}$*) for Staffordshire 2015 to 2019[7] *** Fraction of annual all-cause adult mortality attributable to anthropogenic (human-made) particulate air pollution (measured as fine particulate matter, $PM_{2.5}$*)**

	2015			2016			2017			2018			2019		
District/ County	Deaths - all causes persons 30+	%*	Estimated attributable deaths	Deaths - all causes persons 30+	%*	Estimated attributable deaths	Deaths - all causes persons 30+	%*	Estimated attributable deaths	Deaths - all causes persons 30+	%*	Estimated attributable deaths	Deaths - all causes persons 30+	%*	Estimated attributable deaths
Newcastle-under-Lyme	55	4.2	50	1291	4.7	60	1197	4.2	50	1334	4.2	60	1282	4.9	60
Stafford	60	4.7	60	1254	4.8	60	1267	4.3	50	1336	4.2	60	1315	4.9	60
East Staffordshire	55	4.8	50	1065	5.6	60	1098	5.0	50	1093	4.6	50	1128	5.3	60
South Staffordshire	55	4.7	60	1128	5.1	60	1239	4.5	60	1211	4.6	60	1212	5.1	60
Lichfield	50	4.6	50	1044	5.5	60	1070	4.9	50	1087	4.6	50	1093	5.2	60
Staffordshire Moorlands	45	4	40	1110	4.6	50	1127	3.9	40	1108	3.8	40	1080	4.8	50
Cannock Chase	45	4.6	40	879	5.4	50	940	4.7	40	976	4.6	50	908	5.2	50
Tamworth	30	4.9	30	615	6	40	634	5.3	30	653	5.1	30	678	5.6	40
Stoke on Trent	2479	4.9	110	2454	5.0	120	2490	4.4	110	2746	4.4	120	2490	5.2	130
Staffordshire County	390	4.5	390	8386	5.2	430	8572	4.5	390	8792	4.4	390	8692	5.1	440

2.3.2 Actions being taken within Staffordshire to reduce $PM_{2.5}$

A number of the Staffordshire Authorities are currently involved in implementing measures to reduce levels of NO_2 within their areas, which are detailed elsewhere in this report. Whilst there is currently no statutory duty imposed on Local Authorities in England to reduce $PM_{2.5}$, a number of the measures are complementary. A mapping exercise completed by the Staffordshire Air Quality Forum members details the measures currently in place which are considered to have an impact in reducing $PM_{2.5}$ within the County. These are produced in Table 2.6 below;

Lichfield District Council is taking the following measures as outlined in Table 2.6 and section 2.3.4 in conjunction with our partners at the county council and other partners identified in the table to address $PM_{2.5}$

Table 2.6 - Actions being taken within Staffordshire to reduce $PM_{2.5}$

Measures category	Measure Classification	Effect on reducing NO_x and PM_{10} emissions (low, medium, high)	Reduces $PM_{2.5}$ emissions	Local Authority						
				Staffordshire Moorlands DC	Newcastle under - Lyme BC	Stafford BC	East Staffs BC	Lichfield DC	South Staffs DC	Tamworth BC
Traffic Management	Urban Traffic Control systems, Congestion management, traffic reduction	low	✓	UTC in Leek Town Centre	UTC in areas of Newcastle Town Centre AQMA and Kidsgrove AQMA. Live labs monitoring work linked to congestion in Newcastle.	UTC in Stafford Town Centre	Town Centre Regeneration Programme & a number of schemes are currently being progressed which will aid traffic management. Many of these will help improve traffic flow within the within the AQMA. Live labs monitoring work linked to congestion in Burton.	LDC is liaising with Midlands Connect to increase volume of traffic using M6 Toll to reduce congestion on the A5 as well as lobbying Highways England to upgrade the A38 & A5 to expressways.		UTC in Tamworth Town Centre at Ventura Park
	Reduction of speed limits, 20mph zones	low	✓			20mph zones near some schools in residential areas	20 mph zones near some schools in residential areas	.	20mph zones in Trysull, Bradley, Kinver and Bilbrook	
	Road User Charging (RUC)/ Congestion charging	low	✓					M6 Toll	M6 Toll	
	Anti-idling enforcement	low	✓	Campaign only Air Aware project	Campaign only Air Aware project		Campaign only Air Aware project	Campaign only Air Aware project		
	Other		✓							
Promoting Travel Alternatives	Workplace Travel Planning	low	✓	https://www.staffordshire.gov.uk/Business/Workplace-health/Active-travel-and-air-quality-in-the-workplace.aspx						
	Encourage / Facilitate home-working	low	✓			Homeworking Policy adopted	Homeworking Policy adopted	Homeworking policy adopted	Agile working policy adopted	Homeworking policy adopted
	School Travel Plans	low	✓	https://www.staffordshire.gov.uk/Education/Schooltransport/Active-school-travel/Travel-to-School-Action-Plans-September-2020.aspx						
	Promotion of cycling	low	✓	https://www.staffordshire.gov.uk/Transport/transportplanning/Walking-and-cycling.aspx					South Staffordshire Cycling Scheme	Same as other Staffs authorities
	Promotion of walking	low	✓	https://www.staffordshire.gov.uk/Transport/transportplanning/Walking-and-cycling.aspx					Walking for health scheme	Same as other Staffs authorities
	Staffordshire Share a Lift Scheme		✓	Staffordshire share a lift scheme "on hold" during 2020/21 - under current procurement exercise, new contract to start Sept/Oct 2021.						
	Promote use of rail and inland waterways	medium	✓	North Staffordshire Community Rail Partnership operating along the North Staffordshire Line includes Blythe Bridge station.	North Staffordshire Community Rail Partnership operating along the North Staffordshire Line includes Kidsgrove station. Kidsgrove station to be fully accessible and regenerated through Town Deal.	Redevelopment of Stafford Station into a gateway associated with HS2 works.	Burton Forecourt improvements recently completed.	Lichfield Trent Valley access for all works recently completed including lifts.	Brinsford Park and Ride - Parkway Station business case ongoing	

Measures category	Measure Classification	Effect on reducing NO_x and PM_{10} emissions (low, medium, high)	Reduces $PM_{2.5}$ emissions	Local Authority						
				Staffordshire Moorlands DC	Newcastle under - Lyme BC	Stafford BC	East Staffs BC	Lichfield DC	South Staffs DC	Tamworth BC
Transport Planning & Infrastructure	Local Transport Plans and District Strategies	high	✓	https://www.staffordshire.gov.uk/Transport/transportplanning/District-integrated-transport-strategies/districtintegratedtransportstrategies.aspx						
	Public transport improvements- interchanges stations and services	low	✓	Proposed reinstatement of Leek rail connection	Kidsgrove will be multi-modal	New services with S106 funding provided in Stone to new estates in Walton and Yarnfield. Stafford Gateway will be multi- modal		Lichfield Bus Station resurfaced, repainted and new coach parking bays provided	Parkway station will be multi-modal	Planned improvements at Tamworth station
	Public cycle hire scheme	low	✓		e-scooter trials	e-scooter trials				
	Cycle network	low	✓	https://www.staffordshire.gov.uk/Transport/cycling/cyclemaps.aspx						
	Bus route improvements	high	✓	Potential bus stop upgraded in Cheadle Town Centre	RTPI on key routes in Newcastle Town Centre. Improved future bus services to Chatterley Valley	Improved bus priority and interchange on key routes in Stafford post-SWAR	Improvements in Burton town centre	RTPI introduced at key stops in Lichfield City.	Consideration of future bus stop upgrades on key routes	Corporation Street interchange improvements planned for future delivery
Alternatives to private vehicle use	Bus based Park & Ride	medium	✓					New bus central station as part of Friarsgate development scheme		
	Car Clubs	low	✓	✓						
Policy Guidance and Development Control	Planning applications to require assessment of exposure / emissions for development requiring air quality impact assessment	high	✓	✓		http://www.staffordbc..gov.uk/planning/planning-policy/local-plan-2012-2031	http://www.eaststaffsbc.gov.uk/planning/planning-policy/local-plan-2012-2031	Local plan (lichfielddc.gov.uk)		Local & National Validation requirements 2017: http://www.tamworth.gov.uk/sites/default/files/planning_docs/National-and-Local-Validation-requirements-2017.pdf
	Air Quality Strategy			In development		2019-2021 Air Quality Strategy				

Measures category	Measure Classification	Effect on reducing NO_x and PM_{10} emissions (low, medium, high)	Reduces $PM_{2.5}$ emissions	Local Authority						
				Staffordshire Moorlands DC	Newcastle under - Lyme BC	Stafford BC	East Staffs BC	Lichfield DC	South Staffs DC	Tamworth BC
	Planning Guidance for developers		✓	In development		http://www.staffordd c.gov.uk/planning/pl anning-policy/supplementar y-planning-policy-documents	Informal guidance in place	In development	Sustainable Development	https://www.ta mworth.gov.uk /sites/default/fil es/planning_d ocs/Tamworth _Design_SPD _July_2019_v 1-0.pdf
	Developer Contributions based on damage cost calculation		✓				Damage cost assessment now required for applicable applications.			
	Planning Policies		✓	• Policy T1: Development and Sustainable Transport• Policy SD2: Renewable/Low-Carbon Energy		http://www.staffordb c..gov.uk/planning/p lanning-policy/local-plan-2012-2031	Supplementary planning document in development	Planning policy (lichfielddc.gov.uk)	Planning policies and guidance	https://www.ta mworth.gov.uk /local-plan
	STOR Sites (Short Term Operating Reserve) Energy Generation. Regulation via planning / permitting regime	high	✓	✓						
	Low Emissions Strategy	high	✓	In development						
Freight and Delivery Management	Freight Consolidation Centre	medium	✓							
	Route Management Plans/ Strategic routing strategy for HGV's	high	✓	https://www.staffordshire.gov.uk/Transport/transportplanning/localtransportplan/home.aspx						
	Quiet & out of hours delivery	low	✓			✓				
	Delivery and Service plans	medium	✓			x				
	Freight Partnerships for city centre deliveries	high	✓			x				

Measures category	Measure Classification	Effect on reducing NO_x and PM_{10} emissions (low, medium, high)	Reduces $PM_{2.5}$ emissions	Local Authority						
				Staffordshire Moorlands DC	Newcastle under - Lyme BC	Stafford BC	East Staffs BC	Lichfield DC	South Staffs DC	Tamworth BC
Vehicle Fleet Efficiency	Driver training and ECO driving aids	medium	✓			✓				
	Promoting low emission public transport	high	✓			x				
	Vehicle retrofitting programmes	medium	✓		Bus retrofit for vehicles using A53 service 4	x		Retrofitting of old Council owned HGVs and Buses with pollution abatement equipment will be considered by the Council where technically and financially feasible		
	Fleet efficiency and recognition schemes	medium	✓							
Promoting low emission transport	Low emission zone (LEZ) Clean Air Zone (CAZ)	high	✓							
	Public Vehicle Procurement - Prioritising uptake of low emission vehicles	high	✓	In development		Waste fleet vehicles comply with Euro VI.				
	Company Vehicle Procurement - Prioritising uptake of low emission vehicles	high	✓	In development				LDC looking to replacing old vehicles within the fleet with more modern cleaner vehicles, which comply with the prevailing EURO standard. This will be extended to all Council owned vehicles.		
	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	high	✓	In development		Procurement of EV on staff carparks		LDC looking to procure additional EV charge points across council owned car parks		
	Priority parking for LEV's	high	✓			✓		Currently total of 26 Electric Vehicle charging points/spaces within the District, of which 17 are in Lichfield, 4 at Fradley Business Park, 5 at Burntwood View https://www.zap-map.com/locations/lichfield-charging-points/		
	Taxi Licensing conditions	medium	✓			✓				
	Taxi emission incentives	medium	✓			✓				
Environmental permits	Introduction/increase of environment charges through permit systems and economic instruments (Permit fees set centrally)	medium	✓			✓				
	Measures to reduce pollution through IPPC Permits going beyond BAT	medium	✓	https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/211863/env-permitting-general-guidance-a.pdf (Chapter 15)						
	Large Combustion Plant Permits and National Plans going beyond BAT	high	✓							
	Other		✓							

Measures category	Measure Classification	Effect on reducing NO_x and PM_{10} emissions (low, medium, high)	Reduces $PM_{2.5}$ emissions	Local Authority						
				Staffordshire Moorlands DC	Newcastle under - Lyme BC	Stafford BC	East Staffs BC	Lichfield DC	South Staffs DC	Tamworth BC
Other measures	Smoky Diesel Hotline		✓	https://www.gov.uk/report-smoky-vehicle						
	A5 and M6 Partnership		✓			x		Strategy for the A5 2011-2026	Strategy for the A5 2011-2026	
	Domestic Smoke Control advice and Enforcement		✓	✓	-	Pollution - Air, Smoke and Bonfires | Stafford Borough Council (staffordbc.gov.uk)	Smoke control areas | ESBC (eaststaffsbc.gov.uk)	Smoke and bonfire complaint (lichfielddc.gov.uk)	Smoke Control Areas South Staffordshire Council (sstaffs.gov.uk)	
	Garden Bonfires - Advice and nuisance enforcement		✓	✓	-	Pollution - Air, Smoke and Bonfires | Stafford Borough Council (staffordbc.gov.uk)	Bonfires | ESBC (eaststaffsbc.gov.uk)	Smoke complaints and bonfires (lichfielddc.gov.uk)	Bonfires and Smoke South Staffordshire Council (sstaffs.gov.uk)	Air Quality | Tamworth Borough Council
	Commercial burning advice and enforcement		✓	✓	-	Pollution - Air, Smoke and Bonfires | Stafford Borough Council (staffordbc.gov.uk)	Bonfires | ESBC (eaststaffsbc.gov.uk)	Smoke complaints and bonfires (lichfielddc.gov.uk)	Bonfires and Smoke South Staffordshire Council (sstaffs.gov.uk)	Air Quality | Tamworth Borough Council
	Multi agency working with Fire Service and Environment Agency for trade burning		✓	✓	-	✓		Information shared as appropriate		Information shared as appropriate
	Multi agency working with Staffordshire Fire Service and Local Authority Building Control regarding chimney fires and complaints about DIY domestic heating systems		✓	✓	-	✓		Information shared as appropriate		
	Stoke-on-Trent Low Carbon District Heat Network		✓	-	-	✓				

2.3.3 $PM_{2.5}$ in Staffordshire & Stoke-on-Trent - Next steps

As $PM_{2.5}$ is an issue requiring collaboration between the district, county and city authorities within Staffordshire, the following actions are proposed in addition to those outlined in the action plan. Progress on these and the action plan will be detailed in the 2020 ASR. This has been delayed due to the Covid Pandemic

✓ To agree a target for reducing Fraction of All-Cause Mortality from $PM_{2.5}$ in each district, city and county authority by 2020 this was delayed due to disruption caused by the Covid Pandemic

✓ To agree a target for reducing $PM_{2.5}$ exposure (calculated from PM_{10} exposure / background maps / local monitoring where available)

✓ To maintain compliance with the 2020 EU limit value of 25µg/m3

✓ To include Public Health Outcome Framework Indicator D01 in the Staffordshire and District Authority and City Council Joint Strategic Needs Assessment for 2019/2020 onwards and to report progress to the relevant Health and Wellbeing Boards. This was delayed due to disruption caused by the Covid-19 Pandemic

✓ To continue to identify risks affecting $PM_{2.5}$ which need to be addressed at a national level e.g.

✓ A number of authorities within Staffordshire are receiving applications for STOR (Short Term Operating Reserve) sites to supplement power to the National Electricity Grid at times of peak demand. These sites typically operate during the autumn / winter months and can be high emitters of PM.

3 Air Quality Monitoring Data and Comparison with Air Quality Objectives and National Compliance

This section sets out the monitoring undertaken within 2020 by Lichfield District Council and how it compares with the relevant air quality objectives. In addition, monitoring results are presented for a five-year period between 2016 and 2020 to allow monitoring trends to be identified and discussed.

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

Lichfield District Council currently does not undertake automatic (continuous) monitoring within its area of jurisdiction.

3.1.2 Non-Automatic Monitoring Sites

Lichfield District Council undertook non- automatic (i.e. passive) monitoring of NO_2 at 31 sites during 2020. Table A.1 in Appendix A presents the details of the non-automatic sites.

Maps showing the location of the monitoring sites are provided in Appendix D: Map(s) of Monitoring Locations and AQMAs. Further details on Quality Assurance/Quality Control (QA/QC) for the diffusion tubes, including bias adjustments and any other adjustments applied (e.g. annualisation), are included in Appendix C.

Individual Pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for bias, annualisation (where the annual mean data capture is below 75% and greater than 25%), and distance correction. Further details on adjustments are provided in Appendix C.

3.1.3 Nitrogen Dioxide (NO_2)

Table A.2 in Appendix A compare the ratified and adjusted monitored NO_2 annual mean concentrations for the past five years with the air quality objective of 40µg/m^3. Note that

the concentration data presented represents the concentration at the location of the monitoring site, following the application of bias adjustment and annualisation, as required (i.e. the values are exclusive of any consideration to fall-off with distance adjustment).

For diffusion tubes, the full 2020 dataset of monthly mean values is provided in Appendix B. Note that the concentration data presented in Table B.1 includes distance corrected values, only where relevant.

There have been no changes to the monitoring network across the Lichfield District during 2020.

AQMA 1: A5 – Muckley Corner

In 2020 the highest NO_2 concentration recorded within the A5 Muckley Corner AQMA (i.e. AQMA.1) was 34.3µg/m^3 at site MUC-1B. With a concentration of 44.2µg/m^3 in 2019 for this site, this concentration represents a decrease of 25.2% (9.9µg/m^3), while 43.3µg/m^3 in 2018 represents a decrease of 23.2% (9µg/m^3), when compared with 2020. The second highest concentration in 2020 was 33.5µg/m^3 recorded at site MUC-3, which overall has historically recorded the highest NO_2 concentrations within this AQMA and indeed across the whole of the Lichfield District. In 2019 the NO_2 concentration for site MUC-3 was 45.9 µg/m^3 which represents a decrease of 28.9% (12.4µg/m^3), while 52.5µg/m^3 in 2018 represents a decrease of 41.9% (19µg/m^3), when compared with 2020. Monitoring sites within the A5 Muckley Corner AQMA have overall shown a downward trend in NO_2 concentrations over the past five years.

AQMA 2: A38 (Streethay to Alrewas)

In 2020 the highest NO_2 concentration recorded within the A38, Streethay to Alrewas AQMA (i.e. AQMA.2) was 25.2µg/m^3 at site A38-2A. In 2019, the NO_2 concentration for this monitoring site was 35.3µg/m^3 which represents a decrease of 33.4% (10.1µg/m^3), while 38.3µg/m^3 in 2018 represents a decrease of 41.3% (13.1µg/m^3), when compared with 2020. Monitoring sites within the A38 AQMA have overall shown the most notable downward trend in NO_2 concentrations over the past five years, with concentrations falling below the annual mean NO_2 objective of 40µg/m^3 for the first time in 2017. In 2019 concentrations for all sites within the A38 AQMA were greater than 10% of the annual mean NO_2 objective (i.e. all results dropped below 36µg/m^3) for the first time.

Sites outside of the AQMAs

In 2020, all monitoring sites outside of the AQMAs met the annual mean NO_2 objective. The highest NO_2 concentration recorded outside of the AQMAs was at site LT-8, located on Upper St John Street in Lichfield, with a recorded concentration of 28.9µg/m^3. As this site was only added to the network in October 2019, it is too early to draw any accurate conclusions on long term NO_2 concentrations.

Overall Summary

No exceedances of the annual mean NO_2 objective were recorded at any location within the Lichfield District during 2020. Also no concentrations were recorded within 10% of the annual mean NO_2 objective, with all results below 36µg/m^3.

With respect to the hourly NO_2 objective, results for the past five years show there are no sites within the whole of the Lichfield District where the annual mean has been greater than 60µg/m^3; therefore it is unlikely that the hourly mean objective will be exceeded at any monitoring site.

Monitoring data from 2020 does not represent a normal year due to the emergence of the Coronavirus Pandemic, with the first lockdown in March, tier restrictions and subsequent lockdowns that followed. With a significant reduction in vehicle journeys, NO_2 concentrations are much lower in 2020 across the whole District when compared with previous years and therefore the results should be treated with caution. Despite, results from 2016 to 2019 showing a general downward trend in NO_2 concentrations, there were still consistent exceedances of the objective within the A5 Muckley Corner AQMA up to and including 2019, hence the AQMA should remain in force. Similarly for the A38 Streethay to Alrewas AQMA it was only in 2019 that NO_2 concentrations reached levels that were comfortably below the annual mean NO_2 objective. This AQMA will also remain in force for the time-being, but may be revoked in the next two years if this current trajectory continues.

All long term NO_2 trends (i.e. 2016-2020) for the Lichfield District, split into the two AQMAs and sites outside of the AQMAs by geographical area are presented as part of Figure A.1.

Appendix A: Monitoring Results

Table A.1 – Details of Non-Automatic Monitoring Sites

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
L	Lichfield	Urban Background	410544	310760	NO2	No	42.0	N/A	No	2.0
ARM1	A513 Rugeley Road, Armitage	Roadside	406343	316482	NO2	No	29.0	1.4	No	2.0
A38 - 2	Fradley	Roadside	416295	313186	NO2	Yes, AQMA No. 2	10.0	5.0	No	2.0
A38-2A	Fradley	Roadside	416290	313175	NO2	Yes, AQMA No. 2	0.0	6.0	No	2.0
A38 - 1	Alrewas	Roadside	417101	314180	NO2	Yes, AQMA No. 2	9.0	1.0	No	2.0
A38 - 4 (X)	Canwell	Roadside	413978	300834	NO2	No	10.0	6.9	No	2.0
A38 - 4A	Canwell	Roadside	413989	300869	NO2	No	0.0	15.0	No	2.0
A38 - 5A	Canwell	Roadside	413950	300574	NO2	No	35.0	10.0	No	2.0
A38 - 6A	Canwell	Roadside	413961	300539	NO2	No	10.0	25.0	No	2.0
FAZE	A40691 Coleshill Road (No. 38)	Roadside	420442	301806	NO2	No	0.1	2.3	No	2.0

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
A5 - 2B	A5 Wall Lane	Roadside	408667	306500	NO2	No	6.0	2.0	No	2.0
MUC - 1A	Muckley Corner Hotel First Floor	Roadside	408164	306513	NO2	Yes, AQMA No. 1	0.0	5.0	No	7.0
MUC - 1B	Muckley Corner Hotel First Floor	Roadside	408164	306513	NO2	Yes, AQMA No. 1	0.0	5.0	No	7.0
MUC - 1C	Muckley Corner Hotel First Floor	Roadside	408164	306513	NO2	Yes, AQMA No. 1	0.0	5.0	No	7.0
MUC - 1	Muckley Corner Hotel Ground Floor	Roadside	408164	306513	NO2	Yes, AQMA No. 1	0.0	5.0	No	2.0
MUC - 2	Muckley Corner A5 Westbound	Roadside	408165	306487	NO2	Yes, AQMA No. 1	9.0	5.0	No	2.0
MUC - 3	Muckley Corner A461 Southbound	Roadside	408097	306468	NO2	Yes, AQMA No. 1	10.0	5.0	No	2.0
MUC - 4	Muckley Corner A5 Westbound	Roadside	408029	306501	NO2	Yes, AQMA No. 1	2.0	4.0	No	2.0
A5 - 1A	Muckley Corner Westbound	Roadside	407895	306516	NO2	No	6.0	1.0	No	2.0
MUC - 5	Muckley Corner A5 Eastbound	Roadside	408030	306516	NO2	Yes, AQMA No. 1	5.0	2.0	No	2.0
MUC - 6	Muckley Corner A461 Southbound	Roadside	408161	306556	NO2	Yes, AQMA No. 1	5.0	2.0	No	2.0
A5 - 1	A5 West	Roadside	407208	306513	NO2	No	<200	4.0	No	2.0
B	Burntwood	Urban Background	405086	309344	NO2	No	127.0	N/A	No	2.0

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
LT - 1	Lichfield Town - St John St	Roadside	411792	309161	NO2	No	N/A	N/A	No	2.0
LT - 2	Lichfield Town - Trent Valley Road (2 Lime Grove)	Roadside	412782	309774	NO2	No	1.3	0.9	No	2.0
LT - 3	Lichfield Town - Trent Valley Road (No. 101)	Roadside	412991	309869	NO2	No	6.2	2.9	No	2.0
LT - 4	Lichfield Town - Trent Valley Road (No. 155)	Roadside	413183	309945	NO2	No	9.0	2.5	No	2.0
LT - 5	Lichfield Town - Beacon Street (No. 48)	Roadside	411273	309902	NO2	No	2.3	1.1	No	2.0
LT - 6	Lichfield Town - Beacon Street (No. 14)	Roadside	411358	309785	NO2	No	0.2	1.6	No	2.0
LT - 7	Lichfield Town - Upper St John Street (No. 96)	Kerbside	411892	308937	NO2	No	1.4	0.5	No	2.0
LT - 8	Lichfield Town - Upper St John Street (No. 127)	Roadside	411951	308839	NO2	No	0.2	1.2	No	2.0

Notes:

(1) 0m if the monitoring site is at a location of exposure (e.g. installed on the façade of a residential property).

(2) N/A if not applicable.

Table A.2 – Annual Mean NO_2 Monitoring Results: Non-Automatic Monitoring (µg/m^3)

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2020 (%) (2)	2016	2017	2018	2019	2020
L	410544	310760	Urban Background	100	100.0	17.6	16.1	15.5	16.3	11.5
ARM1	406343	316482	Roadside	53.8	53.8				18.7	21.8
A38 - 2	416295	313186	Roadside	100	100.0	37.6	30.9	30.8	28.6	21.2
A38-2A	416290	313175	Roadside	100	100.0	**45.1**	37.0	38.3	35.3	25.2
A38 - 1	417101	314180	Roadside	100	100.0	**43.0**	35.4	33.9	25.8	24.8
A38 - 4 (X)	413978	300834	Roadside	34.2	34.2	33.2	29.4	27.5	25.1	22.2
A38 - 4A	413989	300869	Roadside	71	71.0	**45.6**	39.8	**41.7**	39.8	21.7
A38 - 5A	413950	300574	Roadside	90.4	90.4	**41.4**	38.3	33.9	26.7	21.9
A38 - 6A	413961	300539	Roadside	57.1	57.1	31.7	28.2	26.2	27.2	17.8
FAZE	420442	301806	Roadside	100	100.0				39.6	26.3
A5 - 2B	408667	306500	Roadside	94.3	94.3	**41.7**	34.5	37.5	29.6	23.7
MUC - 1A	408164	306513	Roadside	77	77.0	**50.1**	**42.3**	**41.3**	**40.9**	29.5
MUC - 1B	408164	306513	Roadside	92.6	92.6	**56.2**	**41.4**	**43.3**	**44.2**	34.3

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2020 (%) [2]	2016	2017	2018	2019	2020
MUC - 1C	408164	306513	Roadside	92.6	92.6	**56.8**	**41.3**	**41.4**	**42.1**	27.6
MUC - 1	408164	306513	Roadside	100	100.0	**47.2**	39.9	**43.0**	**41.5**	26.3
MUC - 2	408165	306487	Roadside	70.8	70.8	**43.9**	36.3	37.0	34.6	23.7
MUC - 3	408097	306468	Roadside	75.1	75.1	**59.9**	**51.9**	**52.5**	**45.9**	33.5
MUC - 4	408029	306501	Roadside	100	100.0	**47.5**	38.5	39.9	33.5	25.8
A5 - 1A	407895	306516	Roadside	100	100.0	**42.0**	35.2	32.9	27.6	24.4
MUC - 5	408030	306516	Roadside	100	100.0	**46.8**	**46.2**	**41.8**	38.6	28.5
MUC - 6	408161	306556	Roadside	100	100.0	**40.4**	36.8	37.5	29.7	23.2
A5 - 1	407208	306513	Roadside	84.4	84.4	38.9	**40.0**	35.8	34.0	23.9
B	405086	309344	Urban Background	34.2	34.2	18.2	15.1	15.3	15.4	13.6
LT - 1	411792	309161	Roadside	76.5	76.5	**48.0**	30.3	34.6	36.3	25.6
LT - 2	412782	309774	Roadside	100	100.0				36.2	21.9
LT - 3	412991	309869	Roadside	94.3	94.3				29.3	23.0
LT - 4	413183	309945	Roadside	78.7	78.7				31.5	20.5

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2020 (%) (2)	2016	2017	2018	2019	2020
LT - 5	411273	309902	Roadside	86.3	86.3				29.5	18.0
LT - 6	411358	309785	Roadside	100	100.0				34.9	23.0
LT - 7	411892	308937	Kerbside	72.7	72.7				29.1	23.0
LT - 8	411951	308839	Roadside	72.7	72.7				**42.1**	28.9

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG16.**

☒ **Diffusion tube data has been bias adjusted.**

☒ **Reported concentrations are those at the location of the monitoring site (bias adjusted and annualised, as required), i.e. prior to any fall-off with distance correction.**

Notes:

The annual mean concentrations are presented as µg/m^3.

Exceedances of the NO_2 annual mean objective of 40µg/m^3 are shown in **bold**.

NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined**.

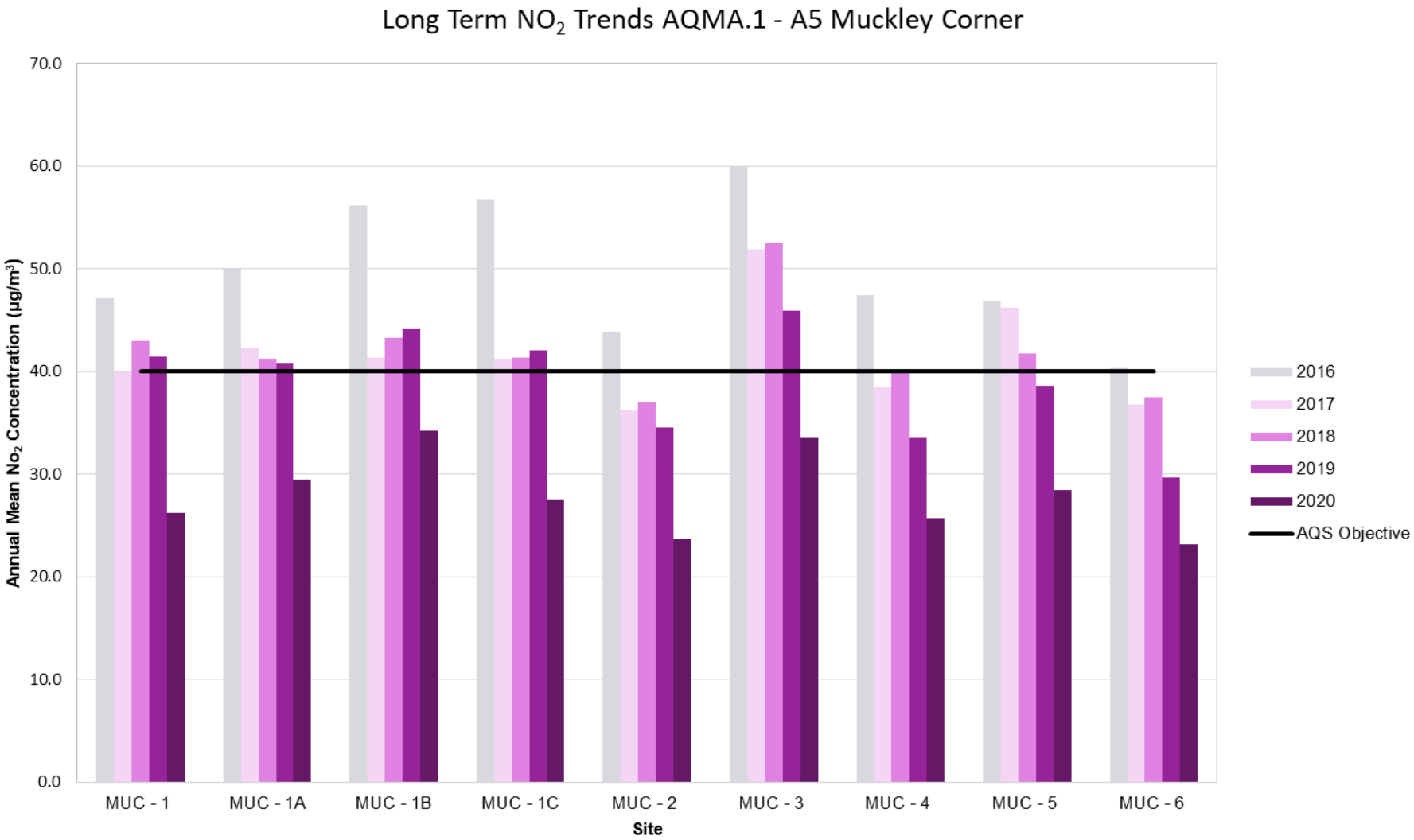
Means for diffusion tubes have been corrected for bias. All means have been "annualised" as per LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

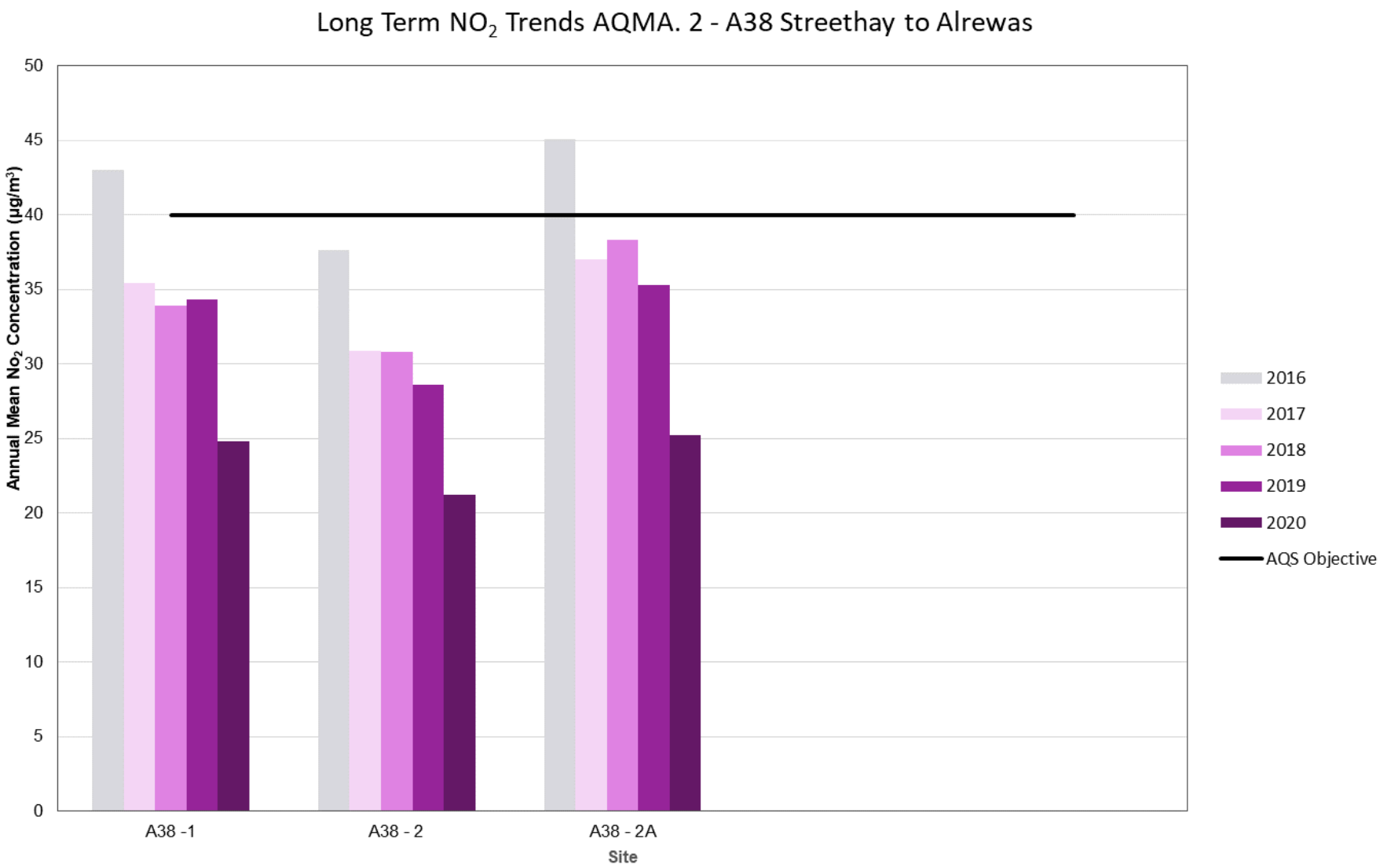
Concentrations are those at the location of monitoring and not those following any fall-off with distance adjustment.

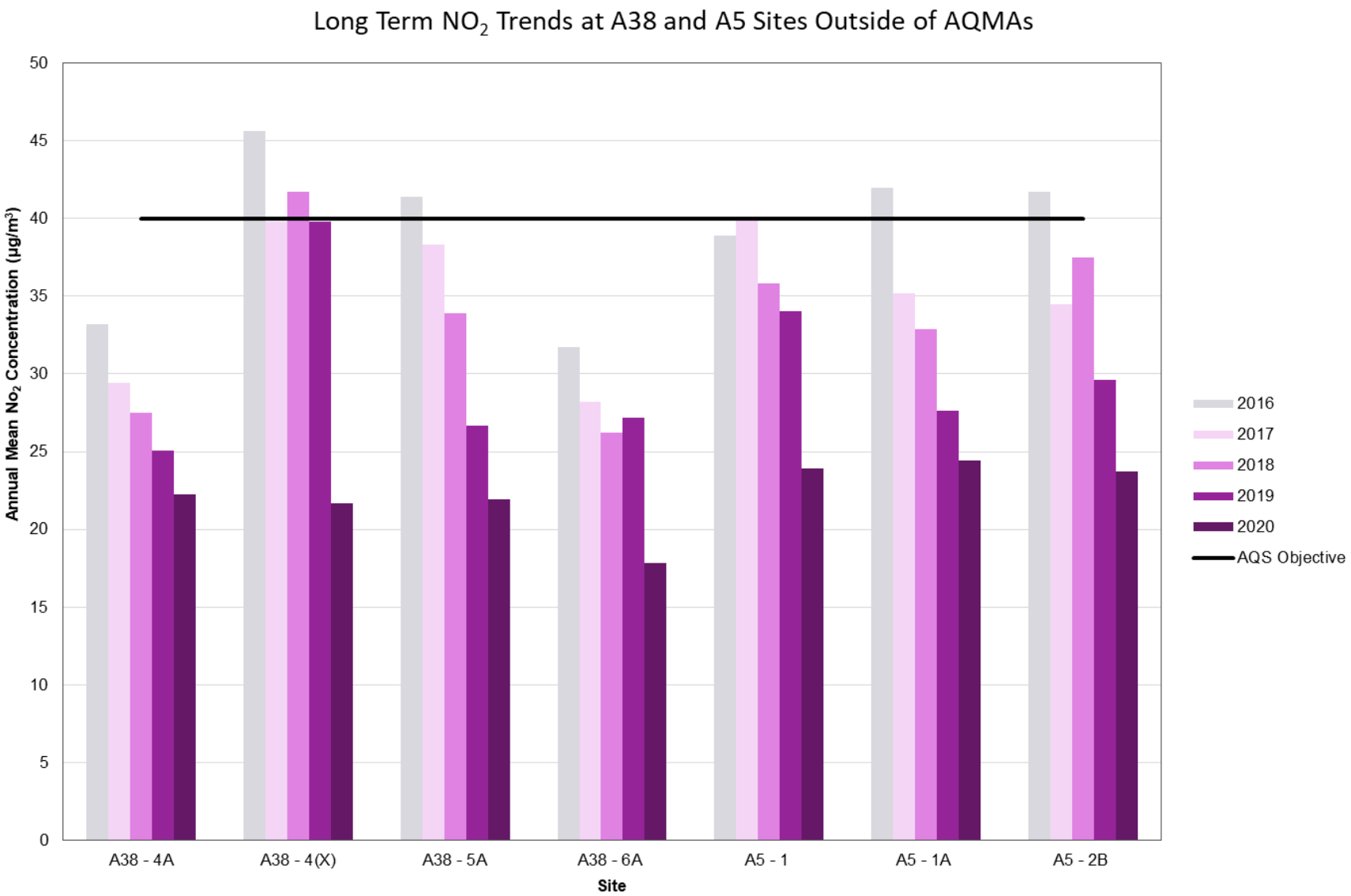
(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

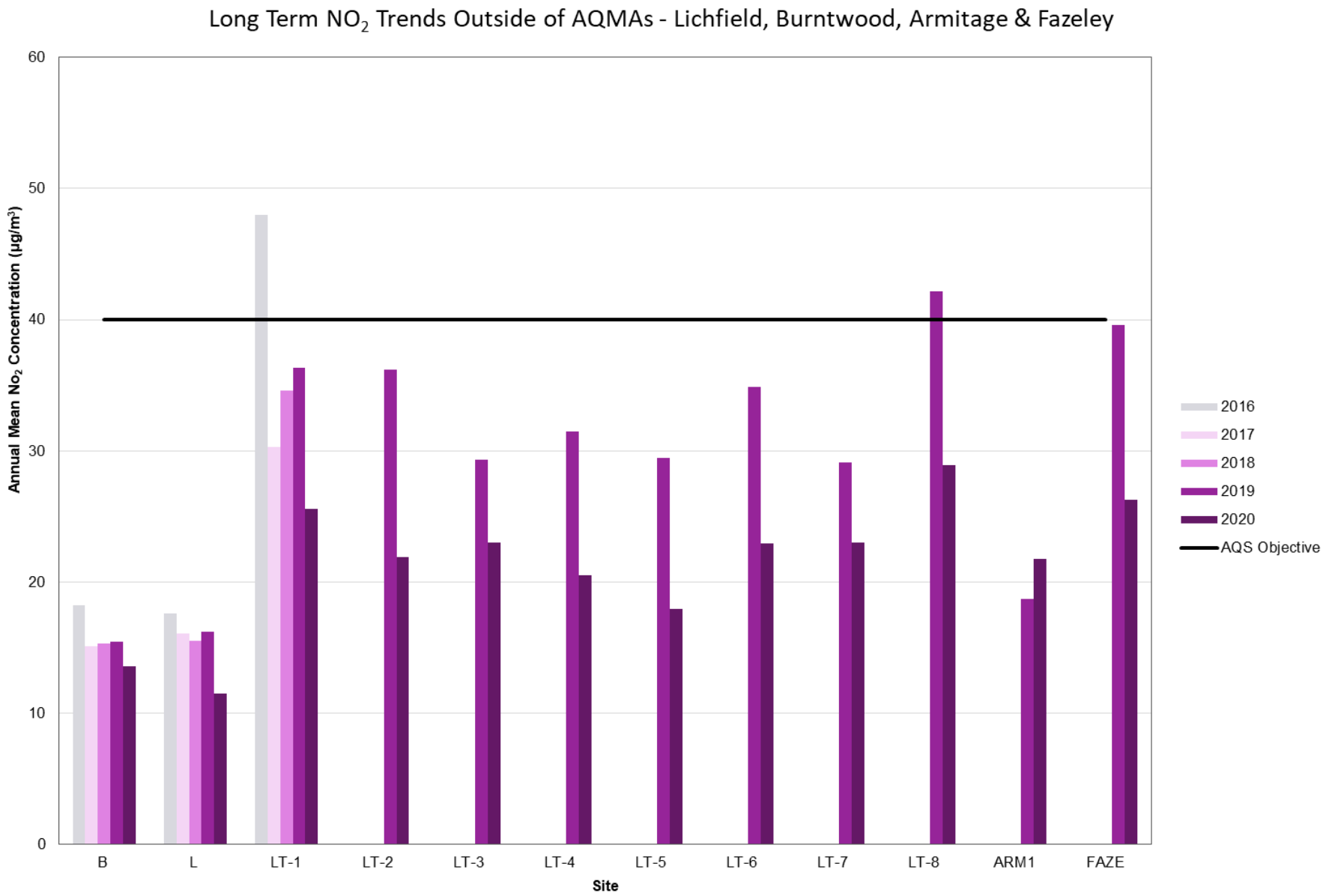
(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

Figure A.1 – Trends in Annual Mean NO_2 Concentrations




Long Term NO2 Trends AQMA. 2 - A38 Streethay to Alrewas
Annual Mean No2 Concentration (µg/m3)
50
45
40
35
30
25
20
15
10
5
0
A38 -1
A38 - 2
A38 - 2A
Site
2016
2017
2018
2019
2020
AQS Objective


Long Term NO2 Trends at A38 and A5 Sites Outside of AQMAs
Annual Mean No2 Concentration (µg/m3)
50
45
40
35
30
25
20
15
10
5
0
A38 - 4A
A38 - 4(X)
A38 - 5A
A38 - 6A
A5 - 1
A5 - 1A
A5 - 2B
Site
2016
2017
2018
2019
2020
AQS Objective


Long Term NO2 Trends Outside of AQMAs - Lichfield, Burntwood, Armitage & Fazeley
Annual Mean No2 Concentration (µg/m3)
60
50
40
30
20
10
0
B
L
LT-1
LT-2
LT-3
LT-4
LT-5
LT-6
LT-7
LT-8
ARM1
FAZE
Site
2016
2017
2018
2019
2020
AQS Objective

Appendix B: Full Monthly Diffusion Tube Results for 2020

Table B.1 – NO_2 2020 Diffusion Tube Results ($\mu g/m^3$)

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Easting)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.85)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
L	410544	310760	21.8	15.6	10.6		7.0	8.0	9.7	10.9	14.0	15.8	21.9	17.0	13.5	11.5	-	
ARM1	406343	316482	I/S	25.8	I/S		I/S	15.1	25.2	24.1	27.6	I/S	33.2	I/S	24.5	21.8	-	
A38 - 2	416295	313186	29.6	25.9	20.0		17.4	21.1	14.8	25.6	28.0	29.8	31.5	30.9	25.0	21.2	-	
A38-2A	416290	313175	38.2	30.5	22.5		22.9	26.5	23.3	29.0	35.7	36.6	35.5	31.2	29.6	25.2	-	
A38 - 1	417101	314180	38.3	37.6	18.5		23.1	24.0	26.7	28.6	37.3	37.4	28.4	33.8	29.1	24.8	-	
A38 - 4 (X)	413978	300834	32.3	22.8	I/S		I/S	I/S	I/S	I/S	I/S	I/S	45.8	36.9	34.6	22.2	-	
A38 - 4A	413989	300869	I/S	38.9	20.3		21.6	4.0	30.1	I/S	30.6	33.7	30.8	I/S	24.4	21.7	-	
A38 - 5A	413950	300574	39.0	33.7	13.4		16.8	19.5	25.5	25.2	36.0	34.7	I/S	30.9	25.8	21.9	-	
A38 - 6A	413961	300539	34.6	38.5	11.1		13.5	I/S	I/S	I/S	I/S	I/S	26.8	25.7	23.6	17.8	-	
FAZE	420442	301806	38.7	35.0	21.1		21.4	24.0	29.4	30.4	40.2	38.9	37.4	36.5	30.9	26.3	-	
A5 - 2B	408667	306500	30.6	25.7	23.4		26.0	25.8	24.3	28.1	I/S	32.5	34.1	31.0	27.9	23.7	-	
MUC - 1A	408164	306513	33.7	37.5	I/S		I/S	31.8	29.2	31.8	45.8	33.5	39.3	31.4	34.6	29.5	-	
MUC - 1B	408164	306513	92.8	30.5	30.2		I/S	37.2	31.9	38.7	46.4	36.7	37.7	37.0	40.3	34.3	-	
MUC - 1C	408164	306513	32.7	28.5	27.9		I/S	30.2	27.7	34.2	44.8	33.7	37.6	31.7	32.4	27.6	-	
MUC - 1	408164	306513	38.8	36.4	23.2		33.5	30.3	30.2	16.0	43.9	34.5	37.6	35.5	30.9	26.3	-	
MUC - 2	408165	306487	26.3	26.9	I/S		22.2	26.5	22.4	I/S	35.1	33.1	31.0	26.4	27.9	23.7	-	
MUC - 3	408097	306468	67.5	45.4	21.8		I/S	40.7	I/S	I/S	56.6	51.2	48.2	40.1	43.2	33.5	-	
MUC - 4	408029	306501	33.4	27.2	26.7		26.4	29.2	19.4	28.1	36.5	33.6	39.1	34.0	30.3	25.8	-	

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Easting)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.85)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
A5 - 1A	407895	306516	41.9	34.3	18.7		20.6	24.0	27.4	27.0	32.4	34.2	37.1	29.3	28.7	24.4	-	
MUC - 5	408030	306516	48.0	34.9	23.2		26.4	30.9	36.0	33.1	39.7	37.5	37.2	35.9	33.5	28.5	-	
MUC - 6	408161	306556	44.2	28.8	15.5		18.0	20.7	25.3	24.8	36.9	37.5	33.3	31.7	27.3	23.2	-	
A5 - 1	407208	306513	41.8	27.2	I/S		17.8	21.6	30.2	25.7	32.6	27.1	34.6	28.7	28.1	23.9	-	
B	405086	309344	20.1	17.2	I/S		I/S	I/S	I/S	I/S	I/S	I/S	26.2	20.8	21.2	13.6	-	
LT - 1	411792	309161	41.0	31.1	I/S		19.3	23.7	25.1	27.3	36.6	34.9	34.9	I/S	30.1	25.6	-	
LT - 2	412782	309774	37.3	30.2	22.2		15.8	20.6	18.4	22.7	31.8	26.5	32.6	29.5	25.8	21.9	-	
LT - 3	412991	309869	37.2	24.1	18.9		21.5	24.2	19.3	27.2	I/S	32.7	35.4	34.6	27.1	23.0	-	
LT - 4	413183	309945	37.2	28.2	I/S		13.4	14.5	14.4	19.7	I/S	29.5	28.3	33.2	24.1	20.5	-	
LT - 5	411273	309902	26.6	19.5	16.6		16.2	19.3	13.0	21.4	I/S	I/S	29.8	27.5	21.2	18.0	-	
LT - 6	411358	309785	38.9	29.9	18.9		19.2	20.8	18.8	24.7	30.9	32.1	37.2	32.8	27.0	23.0	-	
LT - 7	411892	308937	39.5	30.4	I/S		16.1	I/S	15.7	20.8	27.9	28.0	32.8	29.5	27.1	23.0	-	
LT - 8	411951	308839	72.5	23.2	I/S		19.5	I/S	24.7	27.6	36.4	33.8	37.1	34.6	34.0	28.9	-	

☒ **All erroneous data has been removed from the NO_2 diffusion tube dataset presented in Table B.1**

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG16**

☐ **Local bias adjustment factor used**

☒ **National bias adjustment factor used**

☒ **Where applicable, data has been distance corrected for relevant exposure in the final column**

☒ **Lichfield District Council confirm that all 2020 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System**

Notes:

Exceedances of the NO_2 annual mean objective of 40µg/m^3 are shown in **bold**.

NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined**.

See Appendix C for details on bias adjustment and annualisation.

Appendix C: Supporting Technical Information / Air Quality Monitoring Data QA/QC

New or Changed Sources Identified Within Lichfield District Council During 2020

The only key major development within the Lichfield District during 2020 was the ongoing High Speed Two project. Both Phase One and Phase 2a of HS_2 will pass through the Lichfield District. Civil works for Phase One commenced in summer 2019. At this stage it is considered unlikely that HS_2 will have any significant adverse air quality impacts, however Lichfield District Council continues to liaise with HS_2, their contractors and other affected authorities throughout the process.

High Speed Two (HS_2) is a planned high-speed railway in the United Kingdom linking London, Birmingham, the East Midlands, Leeds, Sheffield and Manchester. It would be the second high-speed rail line in Britain, after High Speed 1 (HS_1) which connects London to the Channel Tunnel.

Phase One is a north westerly route that will link London Euston to the West Midlands with a connection onto the West Coast Mainland at Handsacre in the Lichfield District, thereby taking services to the North West of England and Scotland. Phase One of HS_2 will pass through the parishes of Hints, Weeford, Swinfen and Packington, Whittington, Fradley and Streethay, and Kings Bromley within the Lichfield District.

The first part of the construction for Phase One, the enabling works (i.e. archaeology, utilities diversions, early planting etc.) has already commenced. Civil engineering works along the Phase One route commenced during summer 2019[9]. The main developments of note to the Lichfield District over the past 12 months has been the construction of a haul road to allow construction traffic access to HS2 work sites off the A38 at Streethay. Various other works have and continue to include relocation of utility works to allow for construction activity, ground and archaeological investigations. These have and

[9] High Speed Two Local Area Engagement Plan: Staffordshire, Phase One, High Speed Two (HS_2) Limited, 2019

continue to lead to temporary road closures, temporary traffic signals and diversions including recent overnight closures of the A38 slip road on the A38 at Streethay, road closures and diversions around Cappers Lane and Darnford Lane in Lichfield and work commenced in October 2020 on a temporary compound and haul road off the A51 near Whittington that will continue to run into 2021. LDC continues to monitor air quality along the A38 and also now on the main arterial routes through Lichfield which should identify the impact of any traffic diversions and disruptions to the local highway network.

An Air Quality Strategy for Phase One[10] has been produced setting out how HS_2 Ltd, its nominated undertakers and contractors will meet Environmental Requirements set out in the Code of Construction Practice (CoCP)[11] to protect the environment and minimise the impact on air quality. At a local level, site specific control measures have been included within Local Environmental Management Plans (LEMPs). The LEMP for the Lichfield District[12] was published in December 2017, taking into account the findings of the main Environmental Statement (ES), supplementary statements and builds on the general environmental requirements set out in the CoCP.

Contracts for both the enabling works and main civil engineering works have now been awarded. The awarded contractors will be required under the LEMP to manage dust, air pollution, odour and exhaust emissions during the construction works in accordance with Best Practicable Means (BPM) taking into account current guidance on 'best practice[13,14]. Specific locations with relevant receptors that should be considered in the contractor's working methods and locations considered in relation to construction traffic exhaust emissions have been identified and our outlined in the LEMP. The locations to be explicitly considered in the Contractor's working methods were assessed to have a low to high risk of dust impacts without mitigation measures. However HS_2 have made a commitment

[10] High Speed Two Air Quality Strategy, High Speed Two (HS_2) Limited, July 2017

[11] High Speed Rail (London-West Midlands) Environmental Minimum Requirements Annex 1: Code of Construction Practice, High Speed Two (HS_2) Limited, February 2017

[12] High Speed Rail (London-West Midlands) Local Environmental Management Plan Lichfield District Council, High Speed Two (HS_2) Limited, December 2017

[13] Guidance on the assessment of dust from construction and demolition: Institute of Air Quality Management, February 2014

[14] Air Quality Monitoring in the Vicinity of Demolition and Construction Sites: Institute of Air Quality Management, October 2018

within the Lichfield LEMP to employ all relevant dust mitigation measures outlined in the CoCP and any site specific measures as deemed necessary. Measures include; planning the site layout, provision of dust suppression, measures to keep roads, accesses and vehicles clean, shielding or provision of filters on plant likely to generate excessive dust beyond site boundaries. Locations identified where construction traffic exhaust emission impacts are likely were reported by HS_2 in the Lichfield LEMP to have negligible impact, but they will remain under review throughout the construction process.

HS_2 has also set emission requirements and targets for the engines of contractor cars, vans and HGVs for the whole route and have been categorised as London Low Emission Zone, Clean Air Zone and Rest of Route. Lichfield is within the Rest of Route category and therefore the requirements applicable to Lichfield are for HGVs to be powered by Euro VI (or higher) engines from the onset of works commencing and for cars and vans to be Euro 6 diesel and Euro 4 petrol from 2020. There are also targets for the use of Ultra Low Emission Vehicles. For Non-Road Mobile Machinery (NRMM) there is a requirement for Euro Stage IIIB from 2017 and for Euro Stage IV from 2020. Further details on the emission standards are set out in HS_2 information Paper E_{31}: Air Quality[15].

An inspection and monitoring programme to assess the effectiveness of mitigation measures set out in the CoCP and LEMP will be implemented by the contractors. Specific locations for dust monitoring are yet to be decided by HS_2, but once agreed monthly monitoring reports will be made publically available.

On the 30th November 2015, the chancellor confirmed the route from the West Midlands to Crewe referred to as Phase 2a. It is anticipated that Phase 2a will open in 2027, six years ahead of the remainder of Phase 2. Phase 2a is subject to its own Hybrid Bill, which was deposited in Parliament on 17 July 2017. This Bill seeks powers to build the route from the West Midlands through Staffordshire to Crewe. As part of this a full Environmental Statement (ES) was produced. A ten week consultation period followed from this and closed on 30th September 2017. LDC submitted a joint response with the County Council, Stafford Borough Council and Newcastle-under-Lyme Borough Council. The Bill received its second reading in the House of Commons on 30th January 2018, which triggered a petitioning period that ran until 26th February 2018. LDC along with the County Council

[15] High Speed Two: Phase One Information Paper, E_{31}: Air Quality, February 2017

petitioned on a range of matters, namely concerns regarding the impact of construction traffic using the existing network in the District, particularly as there will be an overlap in civil engineering works for both Phase One and Phase 2a. Since then the Department for Transport (DfT) have deposited two additional provisions (AP1) and (AP2) to the Bill. LDC together with its partners have made further representations which are currently ongoing. Between March 2018 and May 2019, a cross-party group of MPs, called a Select Committee, considered objections about Phase 2a. On 15th July 2019 the Bill received its Third Reading in the House of Commons, with 263 votes for and 17 votes against. The Bill received its First Reading in the House of Lords on 16th July 2019, and Second Reading on 9th September 2019. The House of Lords petitioning period ended on 16th August 2019. The petition hearings by the Select Committee were due to be held in autumn 2019 but were paused as a result of the general election in December 2019.

However due to delays stemming from the Covid-19 pandemic, it was not until 19th October 2020 that the Bill went to a Select Committee who considered the petitions deposited against it. The Select Committee subsequently published a report setting out their recommendations. Then on 23rd November 2020, the government published its response to the Select Committee's report. This was followed by a Command Paper published on 24th November 2020, setting out the government overview of the case for HS2 Phase 2a and its environmental impacts, in advance of the Bill receiving its Third Reading in the House of Lords. On 14th December 2020 the Bill received its Third Reading in the House of Lords. On 11th February 2021 the Bill secured Royal Ascent and is now the High Speed Rail (West Midlands – Crewe) Act 2021.

Further details relating to the bill and Select Committee can be found on the UK Parliament website.

The Act grants powers to:

- build and maintain HS2 and its associated works
- compulsorily acquire interests in the land required
- affect or change rights of way, including the stopping-up or diversion of highways and waterways (permanently or temporarily)
- modify infrastructure belonging to statutory undertakers (e.g. utility companies)
- carry out work on listed buildings and demolish buildings in conservation areas

- carry out protective works to buildings and third-party infrastructure
- make necessary changes to existing legislation to facilitate construction and operation of HS2

Additional Air Quality Works Undertaken by Lichfield District Council During 2020

Lichfield District Council benefits from having an Integrated Transport Strategy (ITS). The measures in the ITS are aimed at transport measures under the County Council's jurisdiction, which for the Lichfield District are outside of the two AQMAs and currently are not included in the Action Plan as they are unlikely to significantly benefit the two AQMAs. The ITS measures will nevertheless provide some benefit in easing congestion and improving public transport connectivity to the main settlements in the District and therefore will help maintain concentrations of air pollutants below the objectives outside of the AQMAs.

Progress with the Lichfield ITS for 2020/21 is provided below;-

Scheme Name and Location	Scheme Description	Scheme Rationale
Hilliard's Cross junction with A38	The scheme proposes to increase the size of the two-way traffic signs and to emphasize them with yellow backing boards. The line markings and arrows showing two-way traffic on the carriageway are also to be remarked.	This is a location where 6 injury accidents have been recorded in the moist recent three-year period 1/1/17-31/12/19 +known data. One accident was serious and five were slight. Five of the six accidents involved head on collisions and vehicles were travelling on the wrong side of the road. It is believed that drivers leaving the A38 are mistaking the two-way carriageway for a dual carriageway.

Netherstowe Lane & Lincoln Close Lichfield Speed Limits	Carry out a TRO for the 30 mph section of Netherstowe Lane to ensure that it is legally enforceable. Install 30/40 mph signage at the Eastern Avenue / Lincoln Close junction to ensure it is legally enforceable.	To ensure that the highway signage and legal documentation complies with current highway standards and the law on signing speed limits. There is no TRO for Netherstowe Lane speed limit. Lincoln Close is a 30 mph residential road however there are no signs as you exit or join Eastern Avenue to indicate the change of speed limit between 30/40 mph. Low risk of objections.
Speed limit reduction and parking restrictions NMA	Lower the speed limit on Barley Green Lane / Croxall Road Old Road (the road from the roundabout on the A513 towards the NMA) from 60 mph to 40 mph. Install double yellow lines on same section of road.	The Chetwynd (Slater's) Bridge on the A513 near the National Memorial Arboretum (NMA) will be repaired. As part of the scheme, it is proposed that the speed limit will be reduced from 60 to 40 mph on the A513 either side of the bridge. For consistency, the NMA request that a reduction of the speed limit to 40 mph is also made on Barley Green Lane from the roundabout on the A513 and Croxall Road Old Road together with parking restrictions to support safe and appropriate parking for visitors to the NMA. The roads leading to the NMA also support a Tarmac quarry and there are numerous HGV movements which will increase due to HS2.

Burntwood town centre public realm enhancements	Detailed design and consultation on enhancements to public realm, junction improvements, signing strategy and sustainable transport measures. 0.3km of cycle and pedestrian provision will be completed along A5190 Milestone Way between High Street and Sycamore Road, including upgraded toucan crossing, footway widening and cycle provision.	Compliments the regeneration of Burntwood town centre in partnership with key stakeholders, aiding rejuvenation of the town centre and supporting employment and housing growth guided by the Lichfield District Local Plan.
Cappers Lane / Trent Valley Road / Eastern Ave junction improvement, Lichfield	Feasibility and detailed design is required to identify a preferred improvement that will increase capacity at the junction to accommodate proposed housing growth. Delivery will be in a future year when all S106 has been secured.	The improvement is required to accommodate residential development at Streethay and Watery Lane totalling 1,700 dwellings. S106 is available from previous developments to complete design work.
Lichfield directional signage	Following the opening of the Lichfield Southern Bypass, roads will be downgraded to a C road, including A51 Upper St. John St, A5127 (Cappers Lane - The Friary), A5127 (The Friary - Falkland Road). A 7.5 tonne environmental weight restriction will be installed on these roads and St. John St and The Friary. Primary route status will be removed from A5127 Upper St. John St and A5127 Birmingham Road (Upper St. John St - The Friary) and Primary route status will be given to A461 Falkland Road, A461 Sainte Foy Avenue and the bypass. New directional signage will reflect the changes to the road hierarchy. Bridge height signage will be assessed to take account of three low height bridges and HGVs will be discouraged from using Shortbutts Lane. Advanced signing on the trunk road network, A38 and A5 will also be reviewed and agreed with Highways England.	The scheme will reduce traffic impacts to the city centre and encourage use of the most appropriate routes for all traffic especially HGVs. Making sure effective use of the new bypass and supporting development and regeneration of the city centre. Phase 1: pre-bypass completion, review and delivery of improved signing without requirement for future amendments when bypass is complete. Phase 2: post-bypass review and delivery of signing to encourage best use of the bypass and link with amendments made pre-bypass.

Alrewas to NMA cycle route	Improve the cycle link between National Cycle Network route 54 and the National Memorial Arboretum (NMA) by providing enhanced facilities at the A38 / A513 junction, to tie into future proposals to complete the route to the NMA.	Access to the Trent Valley and key attractors in the area such as the NMA via sustainable modes is limited by available infrastructure. The link between NCN54 and the A38 has been delivered with a contribution from Highways England. It is expected that 50% of the spend will be re-imbursed from the Heritage Lottery Fund managed by the Transforming the Trent Valley Project.
Blake Street crossing, Little Aston	Footway extension and pedestrian crossing provision on Blake Street in order to safely access Blake Street rail station.	Local communities in Shenstone have raised concerns about the safety of pedestrians accessing the rail station. Traffic and speed surveys need to identify whether a puffin crossing is required. The local communities will be significantly impacted by HS2.
Pedestrian improvements Whittington	Pedestrian facilities at the junction with Common Lane. Footway enhancements along Common Lane between Tamworth Road and Church Street.	Safety concerns have been identified on the A51 at the junction with Common Lane and the local community, that will be significantly impacted by HS2, has limited footway provision between the A51 and the Whittington, particularly to the Primary School.

Eastern Avenue pedestrian and cycle provision between A51 junction and Dimbles Lane, Lichfield	Review of pedestrian provision at the A51 junction and cycle and footway provision connecting to Dimbles Lane. Shared cycle use needs to be provided along the northern side of the road serving The Friary School and Leisure Centre, with cycling provision at all crossings to connect to residential areas to the south of Eastern Avenue. The A51 junction needs to be reviewed in terms of HGV movements. There are significant drainage issues on footways in the vicinity of the narrow footways adjacent to the school entrance.	Safety concerns have been identified by the Road Safety Foundation at the junction with the A51 and the LCWIP has identified this as a key priority route for cyclists. Footway issues at the school and HGV turning issues have been raised by local communities.
Trent and Mersey Canal Towpath improvement Fradley to Kings Bromley Marina	Design and feasibility for a canal upgrade between Fradley Junction and A515 Kings Bromley Marina	The canal at this location will be 'sandwiched' between Phase 1 and Phase 2a of HS2, with many of the local roads to be used as construction routes by HS2. Improving the towpath to Kings Bromley marina would complement the improvements recently made at Fradley junction which is a popular leisure destination.
Abnalls Lane (A51 Lichfield to Burntwood)	Closure of Abnalls Lane from A51 to St Matthews Road Burntwood providing a safe walking and cycle route parallel to A5190. Pedestrian / cycle crossing provision may be required on A51 to serve Abnalls Lane.	The proposal has been identified through community engagement and is supported by the LCWIP and is part of the National Cycle Network.

QA/QC of Diffusion Tube Monitoring

The diffusion tubes have historically been supplied and analysed by Staffordshire Scientific Services utilising the 20% triethanolamine (TEA) in water preparation method. However, the analysis service moved over to Staffordshire Highways Laboratory early in 2018.

Staffordshire Scientific Services/ Staffordshire Highways Laboratory is a UKAS accredited laboratory and participates in the new AIR-PT Scheme (a continuation of the Workplace Analysis Scheme for Proficiency (WASP)) for NO_2 tube analysis and the Annual Field Inter-Comparison Exercise. Their lab code is 1017. These provide strict performance criteria for participating laboratories to meet, thereby ensuring NO_2 concentrations reported are of a high calibre. The laboratory follows the procedures set out in the Harmonisation Practical Guidance. In 2020, the laboratory scored 100% in AIR-PT round AR036 (January-February 2020) but just 50% for round AR040 (September-October 2020). Rounds AR037 and AR039 were cancelled due to the Covid pandemic. The percentage score reflects the results deemed to be satisfactory based upon the z- score of $< \pm 2$. An issue with the doping method of the diffusion tubes was found to be the reason behind the lower performance score in round AR040. This issue was flagged up and has since been resolved. Indications from early rounds in 2021 show the performance is back up to 100%

The laboratory also takes part in the field inter-comparison scheme. Based on 15 diffusion tube studies, all local authority co-location studies in 2020 were rated as ‘Good’ (tubes are considered to have "satisfactory" precision where the coefficient of variation of duplicate or triplicate diffusion tubes for eight or more periods during the year is less than 20%).

Results for April 2020 were not reported due to the pandemic. Furthermore, due to resource constraints posed by the pandemic, monitoring was only partially completed in adherence with the 2020 Diffusion Tube Monitoring Calendar.

Diffusion Tube Annualisation

Annualisation was required for six non-automatic monitoring sites in the Lichfield District Council area during 2020 as data capture for these sites dropped below 75%. Data from three AURN monitoring sites; Burton on Trent – Horninglow Urban Background, Cannock A5190 Roadside, and Walsall Woodlands Urban Background were selected from the DEFRA UK Air data selector resource to provide location specific diffusion tube average

annualisation factors to apply to the raw data annual mean for each of the six locations in accordance with LAQM.TG16 box 7.9. See Table C.2

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2021 ASR have been corrected for bias using an adjustment factor. Bias represents the overall tendency of the diffusion tubes to under or over-read relative to the reference chemiluminescence analyser. LAQM.TG16 provides guidance with regard to the application of a bias adjustment factor to correct diffusion tube monitoring. Triplicate co-location studies can be used to determine a local bias factor based on the comparison of diffusion tube results with data taken from NO_x/NO_2 continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

As there are no automatic monitoring stations within the Lichfield District to co-locate any diffusion tubes to, a local bias adjustment factor has not been calculated and instead national bias adjustment factors have historically been used by Lichfield District Council. Lichfield District Council have applied a national bias adjustment factor of 0.85 to the 2020 monitoring data, which is based on 15 studies. A summary of bias adjustment factors used by Lichfield District Council over the past five years is presented in Table C.1.

Table C.1 – Bias Adjustment Factor

Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2020	National	09/21	0.85 (15 studies)
2019	National	03/20	0.93 (17 studies)
2018	National	03/19	0.87 (13 studies)
2017	National	03/19	0.88 (19 studies)
2016	National	Not recorded	0.91 (13 studies)

NO_2 Fall-off with Distance from the Road

Wherever possible, local authorities should ensure that monitoring locations are representative of exposure. However, where this is not possible, the NO_2 concentration at the nearest location relevant for exposure should be estimated using the Diffusion Tube

Data Processing Tool/NO_2 fall-off with distance calculator available on the LAQM Support website. Where appropriate, non-automatic annual mean NO_2 concentrations corrected for distance are presented in Table B.1.

No diffusion tube NO_2 monitoring locations within Lichfield District Council met the criteria that required distance correction during 2020.

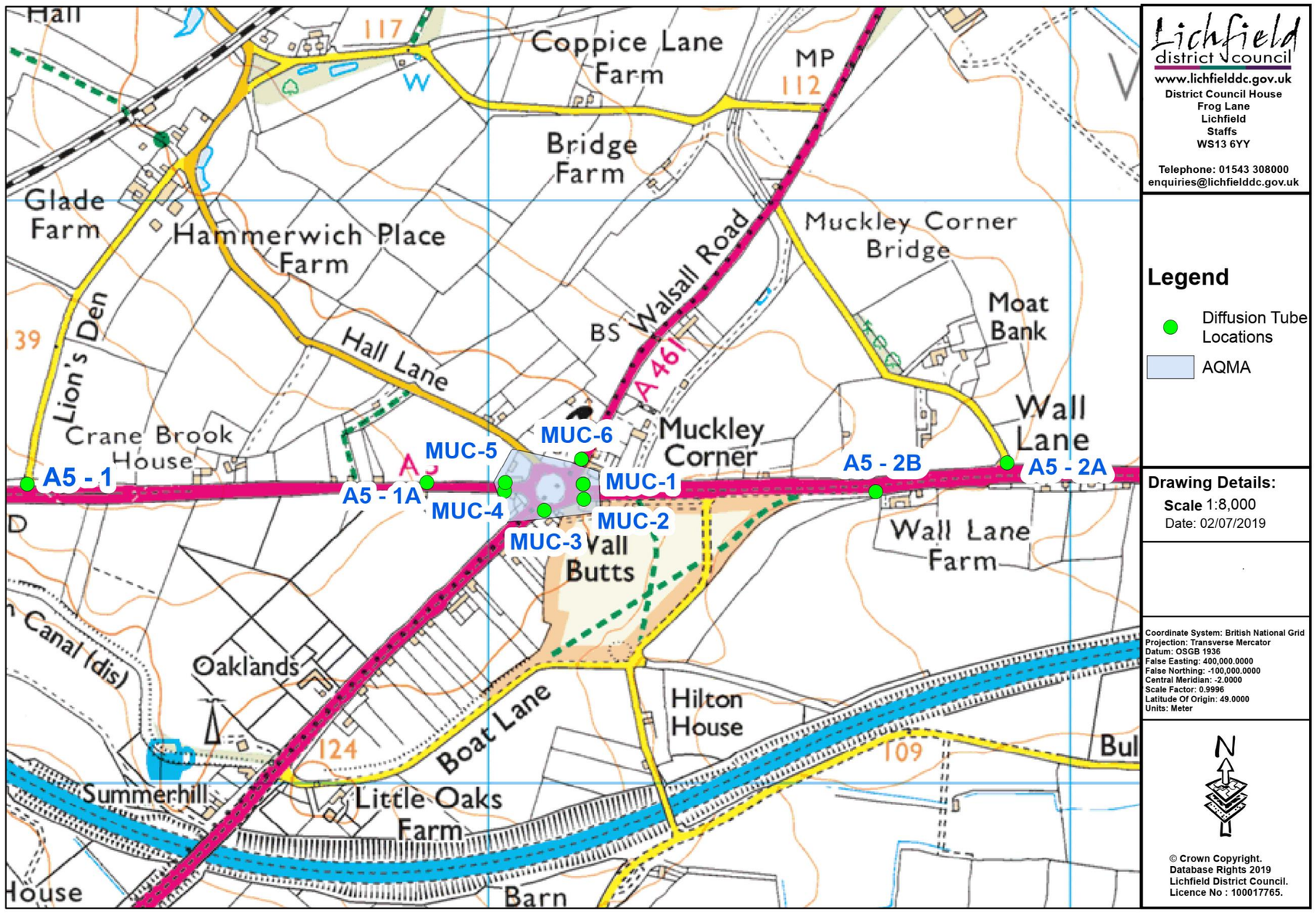
Table C.2 – Annualisation Summary (concentrations presented in µg/m^3)

Site ID	Annualisation Factor Site 1: Burton on Trent Horninglow Urban Background AURN	Annualisation Factor Site 2: Cannock A5190 Roadside AURN	Annualisation Factor Site 3: Walsall Woodlands Urban Background AURN	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean	Comments
ARM1	1.0467	1.0568	1.0373	1.0469	24.5	25.6	
A38 - 4 (X)	0.7286	0.7789	0.7615	0.7563	34.6	26.1	
A38 - 4A	1.0495	1.0311	1.0511	1.0439	24.4	25.5	
A38 - 6A	0.8932	0.8784	0.9006	0.8907	23.6	21.0	
MUC - 3	0.9099	0.9069	0.9205	0.9125	43.2	39.4	
B	0.7286	0.7789	0.7615	0.7563	21.2	16.0	

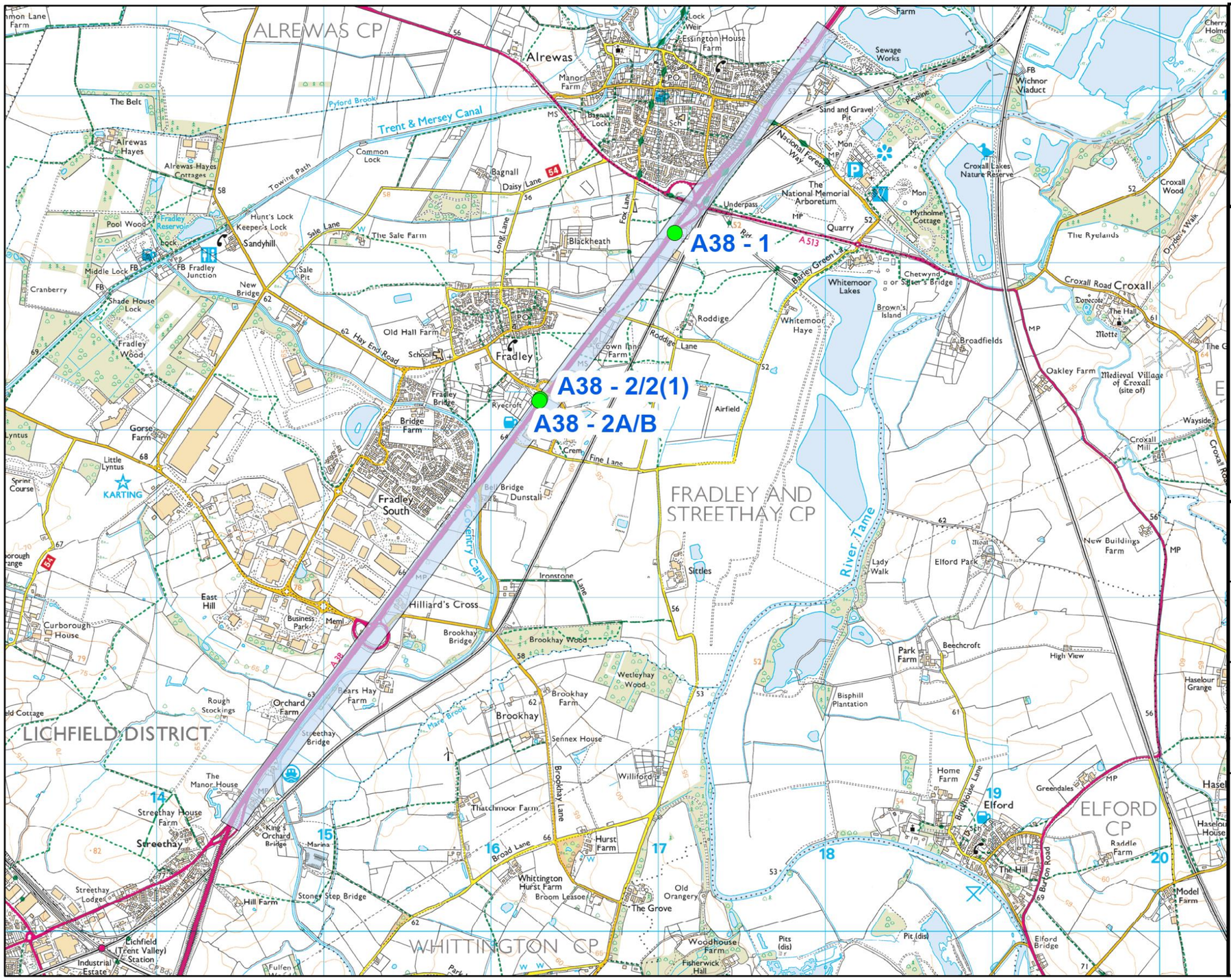
Appendix D: Map(s) of Monitoring Locations and AQMAs

Figure D.1 – Map of Non-Automatic Monitoring Sites

AQMA No.1 - A5 Muckley Corner

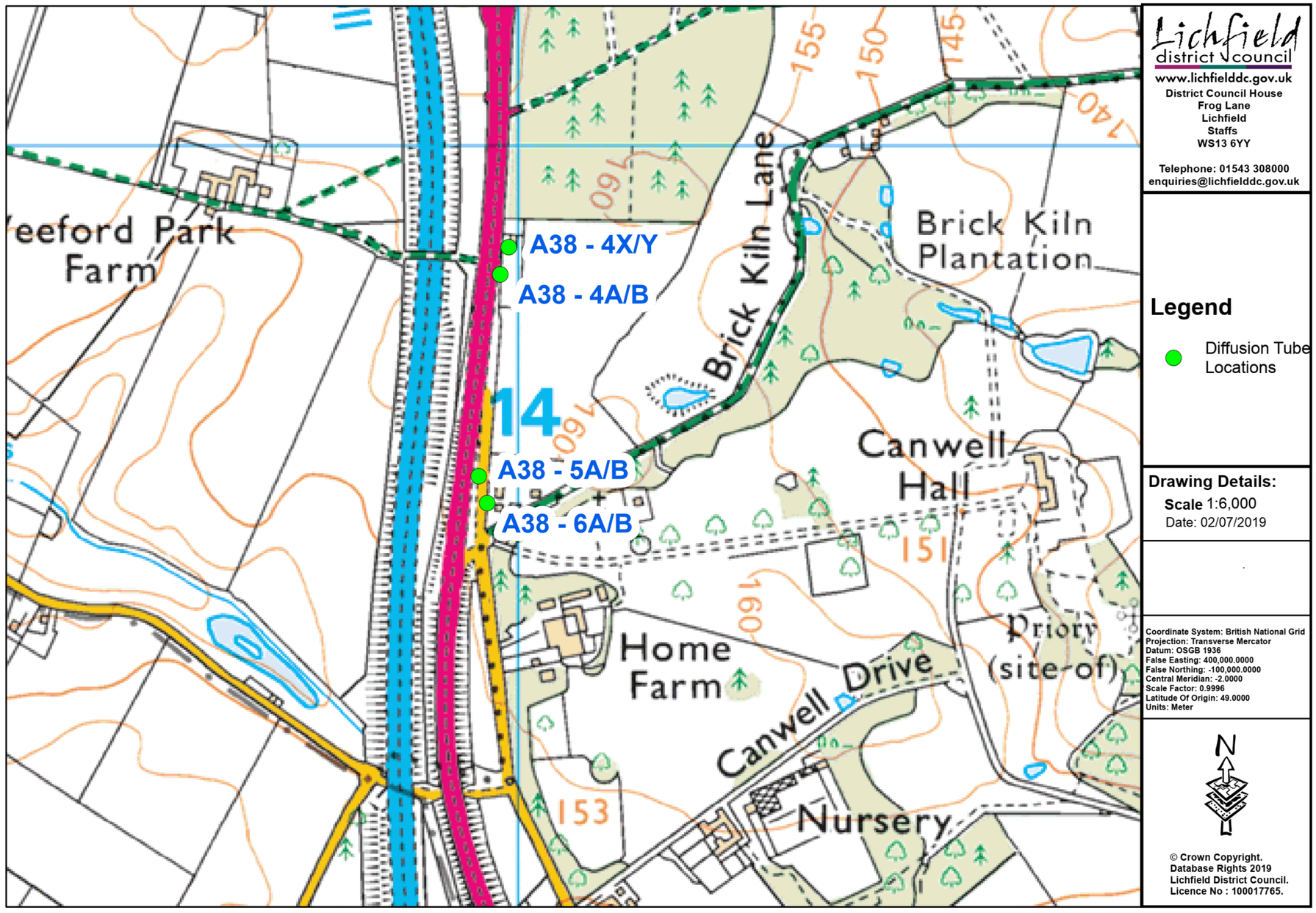


AQMA No. 2: A38 Streethay to Alrewas



Lichfield district council
www.lichfielddc.gov.uk
District Council House
Frog Lane
Lichfield
Staffs
WS13 6YY
Telephone: 01543 308000
enquiries@lichfielddc.gov.uk

Outside of AQMAs: A38 – Canwell Monitoring Locations



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Legend

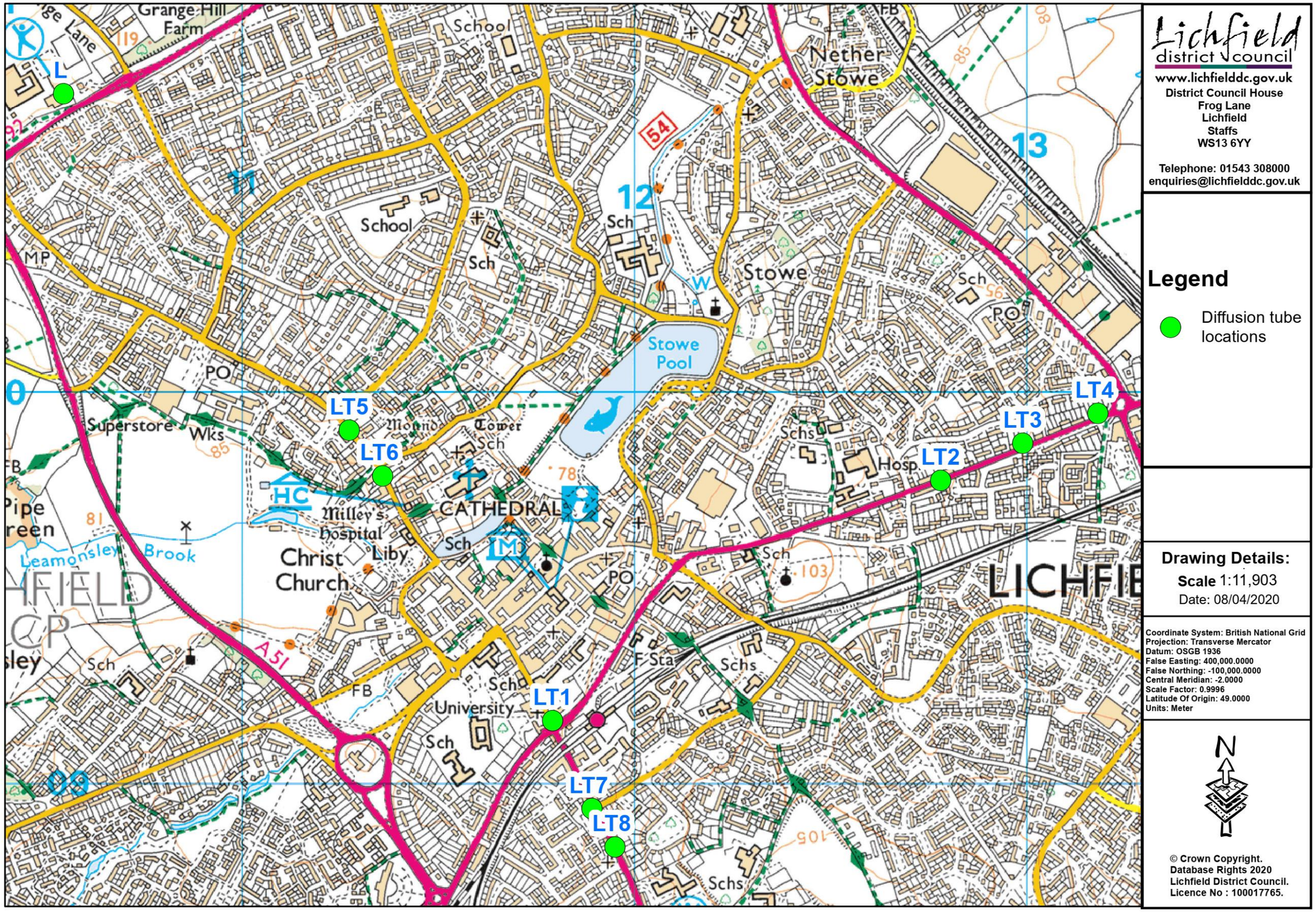
Diffusion Tube Locations

Drawing Details:
Scale 1:6,000
Date: 02/07/2019

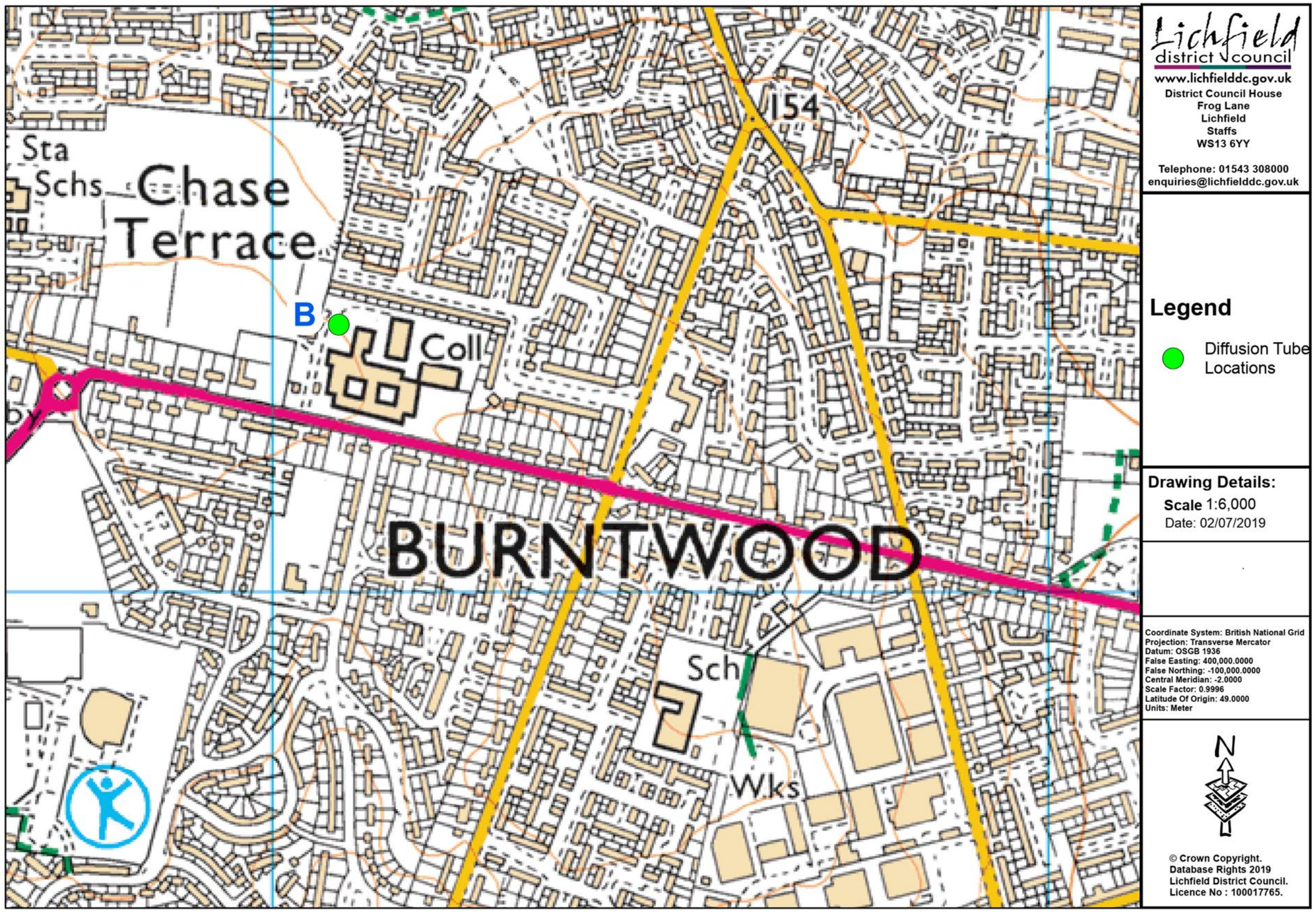
Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
False Easting: 400,000.0000
False Northing: -100,000.0000
Central Meridian: -2.0000
Scale Factor: 0.9996
Latitude Of Origin: 49.0000
Units: Meter

N

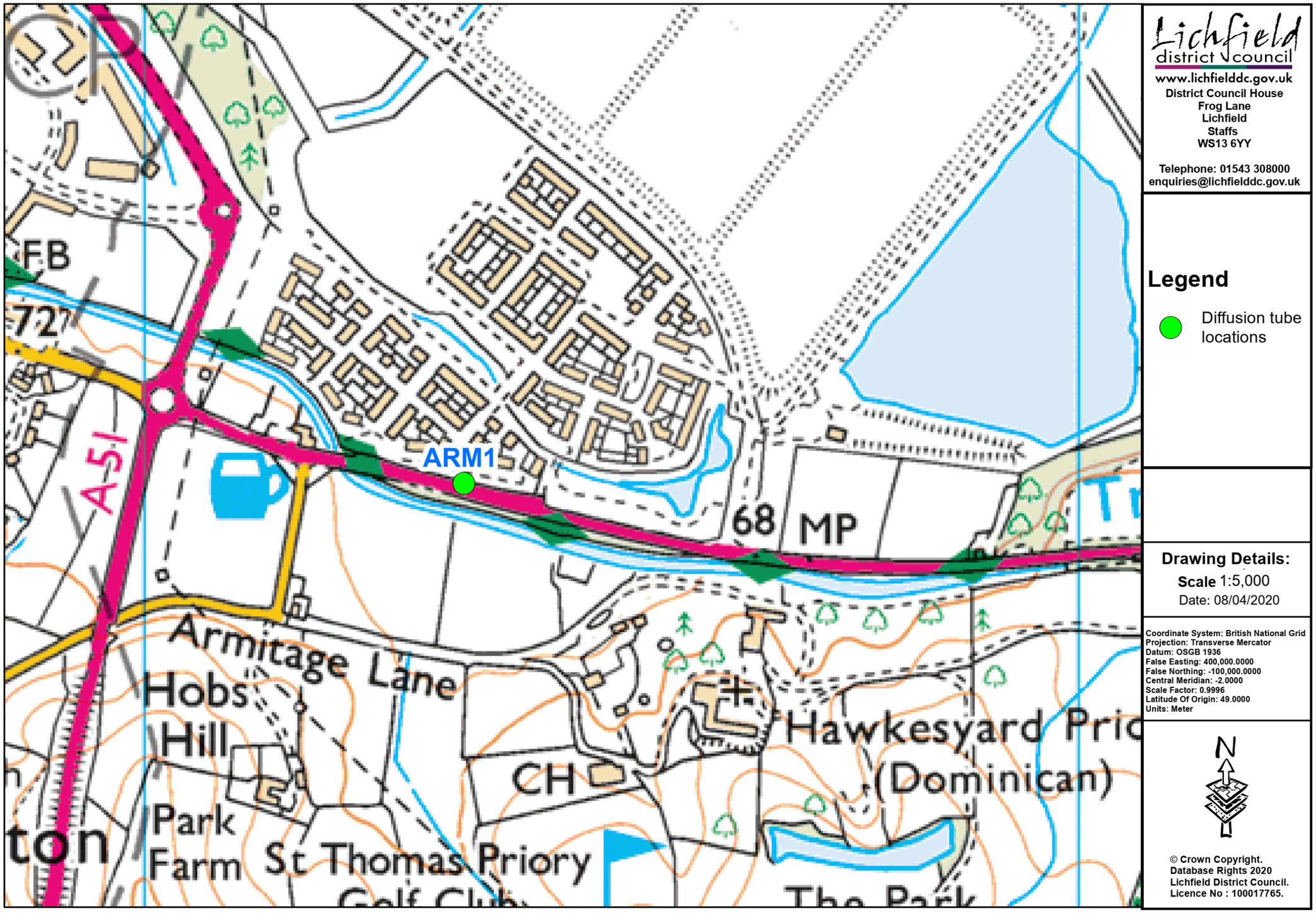
Outside of AQMAs: Lichfield



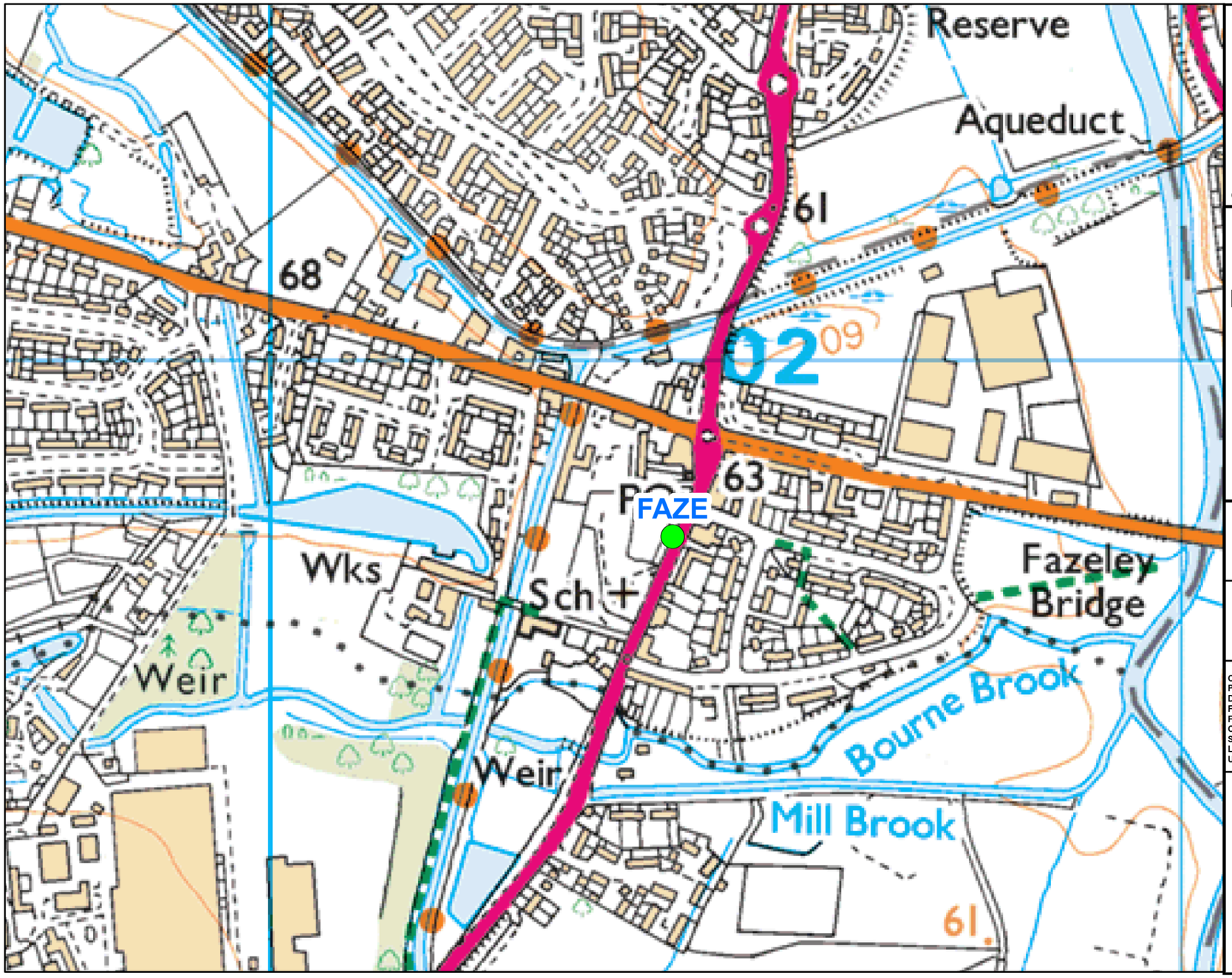
Outside of AQMAs: Burntwood



Outside AQMAs - Armitage



Outside AQMAs – Fazeley



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Legend

Diffusion tube locations

Drawing Details:

Scale 1:5,500

Date: 08/04/2020

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
False Easting: 400,000.0000
False Northing: -100,000.0000
Central Meridian: -2.0000
Scale Factor: 0.9996
Latitude Of Origin: 49.0000
Units: Meter

N

Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England[16]

Pollutant	Air Quality Objective: Concentration	Air Quality Objective: Measured as
Nitrogen Dioxide (NO_2)	200µg/m^3 not to be exceeded more than 18 times a year	1-hour mean
Nitrogen Dioxide (NO_2)	40µg/m^3	Annual mean
Particulate Matter (PM_{10})	50µg/m^3, not to be exceeded more than 35 times a year	24-hour mean
Particulate Matter (PM_{10})	40µg/m^3	Annual mean
Sulphur Dioxide (SO_2)	350µg/m^3, not to be exceeded more than 24 times a year	1-hour mean
Sulphur Dioxide (SO_2)	125µg/m^3, not to be exceeded more than 3 times a year	24-hour mean
Sulphur Dioxide (SO_2)	266µg/m^3, not to be exceeded more than 35 times a year	15-minute mean

[16] The units are in microgrammes of pollutant per cubic metre of air (µg/m^3).

Appendix F: Impact of COVID-19 upon LAQM

COVID-19 has had a significant impact on society. Inevitably, COVID-19 has also had an impact on the environment, with implications to air quality at local, regional and national scales.

COVID-19 has presented various challenges for Local Authorities with respect to undertaking their statutory LAQM duties in the 2021 reporting year. Recognising this, Defra provided various advice updates throughout 2020 to English authorities, particularly concerning the potential disruption to air quality monitoring programmes, implementation of Air Quality Action Plans (AQAPs) and LAQM statutory reporting requirements. Defra has also issued supplementary guidance for LAQM reporting in 2021 to assist local authorities in preparing their 2021 ASR. Where applicable, this advice has been followed.

Despite the challenges that the pandemic has given rise to, the events of 2020 have also provided Local Authorities with an opportunity to quantify the air quality impacts associated with wide-scale and extreme intervention, most notably in relation to emissions of air pollutants arising from road traffic. The vast majority (>95%) of AQMAs declared within the UK are related to road traffic emissions, where attainment of the annual mean objective for nitrogen dioxide (NO_2) is considered unlikely. On 23rd March 2020, the UK Government released official guidance advising all members of public to stay at home, with work-related travel only permitted when absolutely necessary. During this initial national lockdown (and to a lesser extent other national and regional lockdowns that followed), marked reductions in vehicle traffic were observed; Department for Transport (DfT) data[17] suggests reductions in vehicle traffic of up to 70% were experienced across the UK by mid-April, relative to pre COVID-19 levels.

This reduction in travel in turn gave rise to a change of air pollutant emissions associated with road traffic, i.e. nitrous oxides (NO_x), and exhaust and non-exhaust particulates (PM). The Air Quality Expert Group (AQEG)[18] has estimated that during the initial lockdown period in 2020, within urbanised areas of the UK reductions in NO_2 annual mean concentrations were between 20 and 30% relative to pre-pandemic levels, which

[17] Prime Minister's Office, COVID-19 briefing on the 31st of May 2020

[18] Air Quality Expert Group, Estimation of changes in air pollution emissions, concentrations and exposure during the COVID-19 outbreak in the UK, June 2020

represents an absolute reduction of between 10 to 20µg/m^3 if expressed relative to annual mean averages. During this period, changes in $PM_{2.5}$ concentrations were less marked than those of NO_2. $PM_{2.5}$ concentrations are affected by both local sources and the transport of pollution from wider regions, often from well beyond the UK. Through analysis of AURN monitoring data for 2018-2020, AQEG have detailed that $PM_{2.5}$ concentrations during the initial lockdown period are of the order 2 to 5µg/m^3 lower relative to those that would be expected under business-as-usual conditions.

As restrictions are gradually lifted, the challenge is to understand how these air quality improvements can benefit the long-term health of the population.

Impacts of COVID-19 on Air Quality within Lichfield District Council

Measured air pollution levels of nitrogen dioxide (NO_2) at all monitoring locations both inside and outside of the two AQMAs were lower in 2020 than they have been at any time in the last decade, with all locations meeting the annual mean NO_2 objective.

Reductions of annual mean NO_2 concentrations of between 28.2 and 57.9% were experienced at roadside diffusion tube monitoring sites within AQMA 1 during 2020 relative to 2019. Similarly for AQMA 2, reductions of between 4.1 and 40.2% were experienced at roadside diffusion tube monitoring sites during 2020 relative to 2019.

Traffic data for 2019 and 2020 has been sourced from the Department for Transport (DfT) to give an indication of the impact of Covid-19 lockdowns and restrictions on traffic flows and travel behaviours in both AQMA 1 and AQMA 2. For AQMA 1, the total volume of traffic expressed as annual average daily traffic flows (AADT) dropped by approximately 39.9% during 2020 relative to 2019. For AQMA 2, an even greater decline in traffic volume of approximately 67% was experienced in 2020 relative to 2019. Correlations between reductions in traffic volumes and annual mean NO_2 concentrations are demonstrated in Figure F.1 and Figure F.2 for AQMA 1 and AQMA 2 respectively.

The reduction in traffic volumes and corresponding NO_2 concentrations experienced within 2020 provides evidence that objectives can be achieved within the Council's two AQMAs.

Figure F.1 - Correlations between reduction in annual mean NO_2 concentrations and traffic volume in AQMA 1.

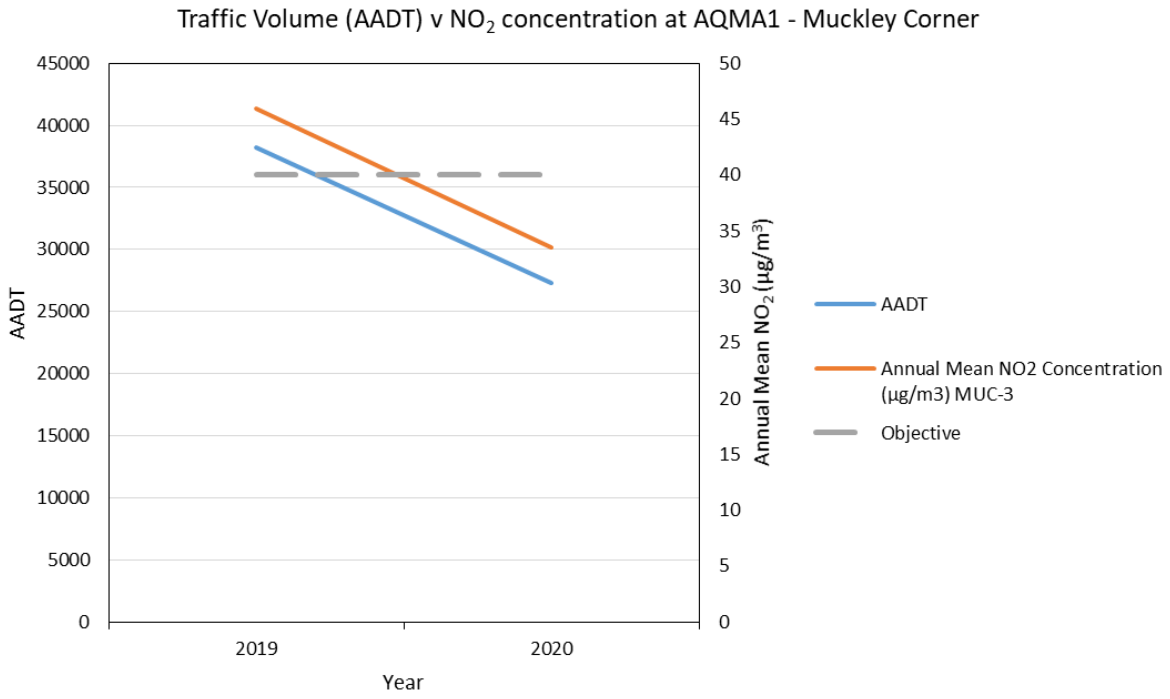
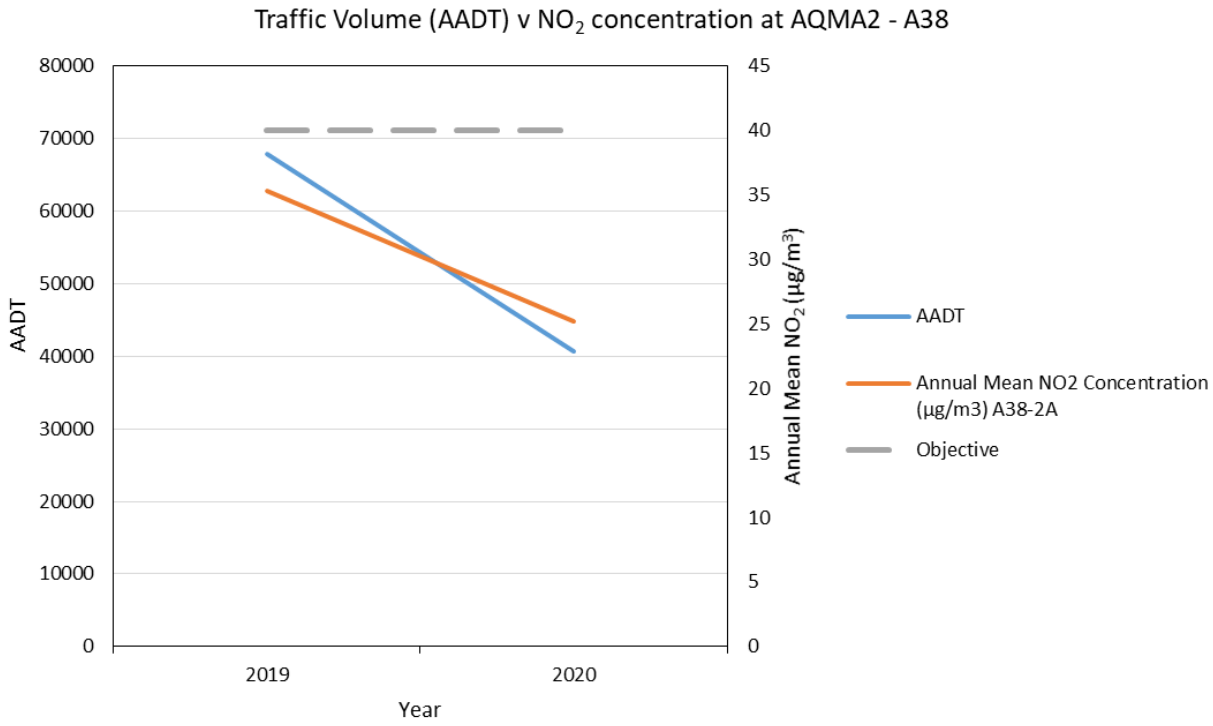


Figure F.2 - Correlations between reduction in annual mean NO_2 concentrations and traffic volume in AQMA 2.



Opportunities Presented by COVID-19 upon LAQM within Lichfield District Council

Potentially, the pattern of flexible working arrangements (homeworking or hybrid working patterns) presented by the pandemic will continue to some extent as the technology and experience has become established. This will reduce the level of commuter traffic and associated emissions.

Challenges and Constraints Imposed by COVID-19 upon LAQM within Lichfield District Council

The following challenges and constraints imposed by Covid-19 impacted the LAQM work of the Council:

- Passive Monitoring Data Capture (%) and Adherence to Diffusion Tube Calendar - During 2020, a combination of staff constraints and limited access to a number of diffusion tube monitoring sites meant it was not possible to adhere strictly to the national monitoring calendar for all sites. This was especially true between March and May 2020, when all diffusion tubes were exposed for more than 2 months as staff were not available to be deployed. In accordance with the impact matrix (Table F.1) the impact can be classed as **Small / Medium**. A combination of limited access to some sites and missing tubes, the latter of which can happen in any normal year affected data capture within 2020. This resulted in some monitoring sites needing to be annualised. However, as only six sites experienced a data capture of between 25% and 75% the impact can be classed as **Small / Medium**.
- Passive Monitoring Bias Adjustment Factor - As with previous years, a national bias adjustment factor has been utilised to adjust the diffusion tube results for 2020. Within 2019 there were 17 co-location studies that were utilised to calculate the bias factor for the laboratory and preparation method used. For 2020, this number reduced slightly to 15 studies. There is therefore the potential for there to be a slightly greater degree of uncertainty associated with the resultant annual mean NO_2 concentrations in 2020 than in previous years, but the overall impact as assessed in accordance with the impact matrix is considered to be **Small.**
- Passive Monitoring (Storage of Tubes) - During the months where diffusion tubes were sent for analysis they were stored and analysed in accordance with laboratory guidance. **No impact**

The impacts as presented above are aligned with the criteria as defined in Table F 1, with professional judgement considered as part of their application.

Table F 1 – Impact Matrix

Category	Impact Rating: None	Impact Rating: Small	Impact Rating: Medium	Impact Rating: Large
Automatic Monitoring – Data Capture (%)	More than 75% data capture	50 to 75% data capture	25 to 50% data capture	Less than 25% data capture
Automatic Monitoring – QA/QC Regime	Adherence to requirements as defined in LAQM.TG16	Routine calibrations taken place frequently but not to normal regime. Audits undertaken alongside service and maintenance programmes	Routine calibrations taken place infrequently and service and maintenance regimes adhered to. No audit achieved	Routine calibrations not undertaken within extended period (e.g. 3 to 4 months). Interruption to service and maintenance regime and no audit achieved
Passive Monitoring – Data Capture (%)	More than 75% data capture	50 to 75% data capture	25 to 50% data capture	Less than 25% data capture
Passive Monitoring – Bias Adjustment Factor	Bias adjustment undertaken as normal	<25% impact on normal number of available bias adjustment colocation studies (2020 vs 2019)	25-50% impact on normal number of available bias adjustment studies (2020 vs 2019)	>50% impact on normal number of available bias adjustment studies (2020 vs 2019) and/or applied bias adjustment factor studies not considered representative of local regime
Passive Monitoring – Adherence to Changeover Dates	Defra diffusion tube exposure calendar adhered to	Tubes left out for two exposure periods	Tubes left out for three exposure periods	Tubes left out for more than three exposure periods
Passive Monitoring – Storage of Tubes	Tubes stored in accordance with laboratory guidance and analysed promptly.	Tubes stored for longer than normal but adhering to laboratory guidance	Tubes unable to be stored according to be laboratory guidance but analysed prior to expiry date	Tubes stored for so long that they were unable to be analysed prior to expiry date. Data unable to be used
AQAP – Measure Implementation	Unaffected	Short delay (<6 months) in development of a new AQAP, but is on-going	Long delay (>6 months) in development of a new AQAP, but is on-going	No progression in development of a new AQAP
AQAP – New AQAP Development	Unaffected	Short delay (<6 months) in development of a new AQAP, but is on-going	Long delay (>6 months) in development of a new AQAP, but is on-going	No progression in development of a new AQAP

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ASR	Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by Highways England
EU	European Union
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm or less
$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO_2	Sulphur Dioxide

References

- Local Air Quality Management Technical Guidance LAQM.TG16. April 2021. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Local Air Quality Management Policy Guidance LAQM.PG16. May 2016. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.